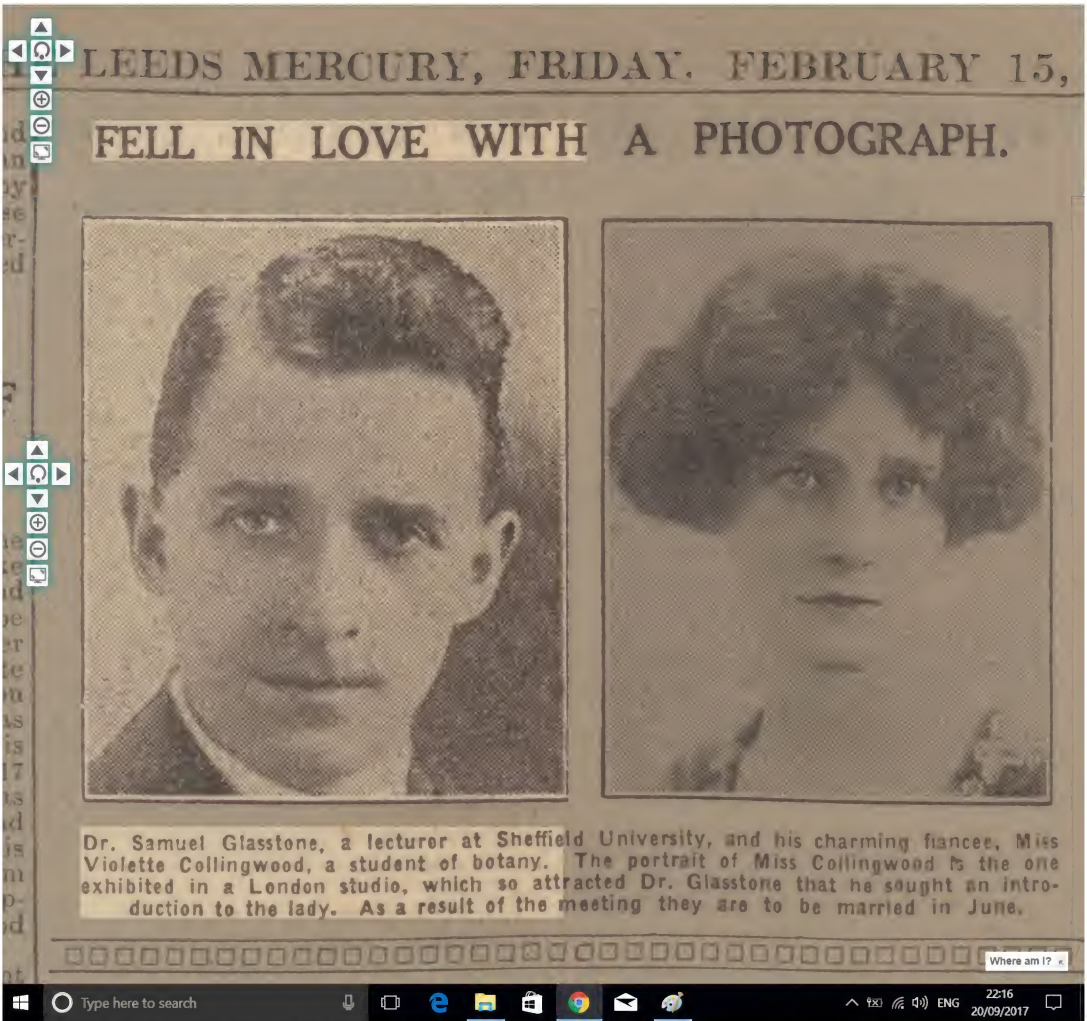


Credible nuclear deterrence effects, debunking dogmatic "disarm or be annihilated" enemy propaganda. Realistic effects and credible nuclear weapon capabilities for deterring or stopping aggressive invasions and attacks which could escalate into major conventional or nuclear wars.

Wednesday, September 20, 2017  
1929 photo of Dr Samuel Glasstone for a Leeds Mercury newspaper love story (plus Glasstone's WWI TNT effects experience, and Russian translations of Glasstone and classified Russian nuclear weapons manuals)  
For an amusing break from news of the North Korean Missile Crisis, have a look at the photo story newspaper clipping from *The Leeds Mercury* 15 February 1929 (the day after Valentine's Day).



THE LEEDS MERCURY (NEWSPAPER), 15 FEBRUARY 1929, PAGE 4 (DAY AFTER VALENTINE'S)  
www.britishnewspaperarchive.co.uk/viewer/bl/0000748/19290215/D66/0004#  
Samuel Glasstone's photo was published for a love story on page 4 of *The Leeds Mercury* newspaper, England, Friday 15 February 1929 (newspaper clipping copyright Johnston Press plc, c/o British Newspaper Archive; however the actual photographs are not necessarily the copyright of the publisher).

I found this amusing article while searching for another photo of Glasstone (the one on a blog post in 2006 is from the U.S. Atomic Energy Commission's 1967 third edition of *Sourcebook on Atomic Energy*). As we noted in the 2006 blog post about Glasstone and Dolan, Glasstone was a chemistry lecturer at Sheffield University and in May 1928 gave a series of five BBC radio broadcasts on "chemistry in daily life", which formed the basis for his first book, published in 1929.

Violette Collingwood, who Glasstone married, illustrated that first book, and also helped him to edit the classified 1950 (Korean War era) book on *Radiological Defense, Volume II* as Walmer E. Strobe describes in detail in his *Autobiography of a Nerd* (chapter 9, page 115): "In the summer of 1950, as the Marines were desperately trying to halt the North's invasion of South Korea, we received word from AFSWP that Samuel Glasstone would be arriving to accomplish the final editing of RD2. ... Glasstone arrived but not by himself. He had his wife with him. She, it turned out, did not come to keep house for Sam. She was his help-meet at work; not a secretary, mind you, but a full-fledged partner. Fortunately, the office I had

reserved for Glasstone was large enough for the Glasstones. They sat across from each other at a library table and passed our drafts back and forth."

(Note that extracts from the Glasstone's edited *Radiological Defense volume 2, The Principles of Military Defense Against Atomic Weapons*, can be found [here](#).)

In addition, she also helped Glasstone with the editing of *The Effects of Nuclear Weapons 1957* (see Glasstone's 1 February 1957 letter to Colonel Dent L. Lay of the AFSWP).

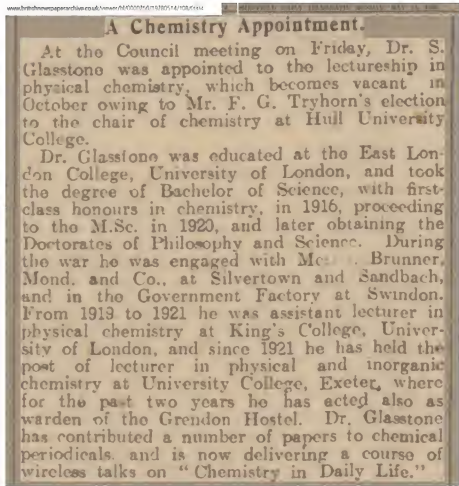
According to the amusing 15 February 1929 newspaper article, Glasstone had spotted a photo of botany student Collingwood exhibited at a London studio:

"The portrait of Miss Collingwood is the one exhibited in a London studio, which so attracted Dr Glasstone that he sought an introduction to the lady. As a result of the meeting they are to be married in June."



**Update (26 September 2017): more about Samuel Glasstone**

There is an interesting article about Samuel Glasstone on page 4 of the 14 May 1928 *Sheffield Daily Telegraph* which explains that he was engaged at Brunner Mond on chemistry research during World War I, including at Silvertown, where the Brunner Mond TNT factory blew up:



The Brunner Mond munitions plant at Silvertown where Glasstone worked during the war (in the East End of London) suffered a devastating explosion of 50 tons of TNT on 19 January 1917, destroying 900 houses, killing 73 people, injuring nearly 500, and causing damage to 70,000 homes (these self-goal accidental war effects were a classified secret until 1950, unsurprisingly):



Above: the Silvertown explosion hit London's Royal Docks in the East End of London on January 19, 1917.

"Brunner Mond had established a factory at Crescent Wharf in 1893 to manufacture soda. Two years into the First World War, the Army was facing a crippling shell shortage. The War Office decided to use the factory's surplus capacity to purify TNT from 1915 onwards, despite opposition from Brunner Mond and the fact that the factory was in a highly populated area. Their fears became a reality at 6.52pm on January 19 when a fire in the melt-pot room caused an explosion of 50 tonnes of TNT. ... streets of houses were destroyed in *what is still regarded as the biggest explosion in the history of London*. Fires raged in the nearby flour mill and on ships in the dock. ... Among the dead was Dr Andreas Angel, an Oxford professor doing voluntary war work as the plant's chief chemist. He was attempting to help put out the fire when the explosion happened." - <http://www.londonroyaldocks.com/forgotten-stories-1917-silvertown-explosion-part-one/>

"Historian Graham Hill, who co-wrote with Howard Bloch *The Silvertown Explosion: London 1917*, said: "It was said that by the turn of the century every household in the country owned or had at least one product that had come from Silvertown." Said Graham: "The Minister of Munitions, David Lloyd George, said two years before the explosion: 'Even after utilising every workshop and factory capable of turning out munitions, we found that output would be inadequate unless we supplemented our resources by setting up emergency buildings.'" Despite warnings from Brunner Mond's chief chemist at the time, Dr Francis Arthur Freeth, that there would be a catastrophe sooner or later, the Ministry of Munitions believed it was worth taking the risk and the factory began TNT production in September 1915." - <http://www.londonroyaldocks.com/forgotten-stories-1917-silvertown-explosion-part-two/>

**UPDATE (4 November 2017):** Russian edition of Samuel Glasstone's 1962 revision of the *Effects of Nuclear Weapons*, and some classified Russian manuals on nuclear weapons capabilities and effects





# THE EFFECTS OF NUCLEAR WEAPONS

# ДЕЙСТВИЕ ЯДЕРНОГО ОРУЖИЯ

REVISED EDITION

Перевод с английского

ИЗДАНИЕ ВТОРОЕ

April — 1962

ВОЕННОЕ ИЗДАТЕЛЬСТВО  
МИНИСТЕРСТВА ОБОРОНЫ СС  
Москва — 1965

Действие ядерного оружия (перевод с английского)  
Издание 2-е, исправленное

Книга «Действие ядерного оружия» подготовлена к изданию в 1962 году министерством обороны США при участии ряда других американских правительственных учреждений и ведомств.

В книге изложены физические основы ядерных взрывов и дана их классификация. Подробно рассмотрены основные особенности явлений, связанных с воздушными, наземными (надводными) и подземными (подводными) ядерными взрывами и представлены некоторые сведения о высотных и глубоководных взрывах.

Большое место отведено описанию свойств каждого из поражающих факторов ядерного взрыва: ударной волны, светового излучения и всех видов ядерного излучения. Приведены данные о зависимости величины максимального избыточного давления и скоростного напора ударной волны от высоты взрыва и расстояния до его эпицентра. Рассказываются об источниках и свойствах так называемого остаточного ядерного излучения, и, в частности, излагаются принципы прогнозирования вероятных районов заражения в результате выпадения радиоактивных продуктов взрыва и показаны методы определения допустимого времени пребывания в зараженном районе.

Публикуются данные о влиянии ядерных взрывов на работу радио- и радиолокационных средств. Рассмотрены основные принципы защиты от действия ядерного оружия. Сведения о воздействии поражающих факторов ядерного взрыва на людей, боевую технику и различные сооружения уточнены данными, полученными в ходе испытаний и исследовательских работ, которые были проведены в последние годы.

Интерес представляют приводимые в книге сведения о способах обнаружения ядерных взрывов и об обеспечении безопасности при обращении с ядерными боеприпасами.

Книга иллюстрирована фотографиями, рисунками и таблицами.

Научный редактор кандидат технических наук  
полковник Дмитриев П. С.

## ВВЕДЕНИЕ

Когда книга «Действие атомного оружия» была издана в 1950 году, мощность существовавших в то время атомных бомб была эквивалентна нескольким тысячам тонн (килотонн) тротила. Поэтому описание атомных взрывов и их поражающего действия основывалось на результатах взрыва так называемой «нормальной бомбы», мощность которой была эквивалентна 20 килограммам тротила. С развитием термоядерного (водородного) оружия взрыв которого выделяется энергия, равная энергии взрыва нескольких миллионов тонн (мегатонн) тротила, возникла необходимость переиздать книгу «Действие ядерного оружия» в новом варианте. Вариант этой книги, вышедший в свет в 1957 году, стал наиболее полным имевшимся в то время данными о действии ядерного оружия мощностью около 20 мегатонн на человека и на различные материалы.

Известно, что существует возможность создания ядерного оружия мощностью свыше 20 мегатонн. Однако в настоящей книге и в первом ее издании, рассматривается предельная мощность в 20 мегатонн тротилового эквивалента. Вероятное действие ядерного оружия большей мощности можно оценить с помощью аналогий. Используя их с определенными оговариваемыми ограничениями, можно рассчитать предполагаемое действие ядерного взрыва любой заданной мощности.

В настоящее, переработанное издание внесены значительные изменения как по существу содержащихся сведений, так и по их изложению. Материал по защите от ядерных взрывов и радиационной защите, на основе которых строится защита. В связи с этим многочисленные сведения о действии ядерного оружия излагаются в книге в простой табличной форме, удобной для использования в качестве справочного материала. В книгу включена новая глава о действии ядерного оружия на средства радиосвязи и радиолокации, а в приложении приведены правила безопасности при обращении с ядерным оружием и методы обнаружения ядерных взрывов на больших расстояниях.

Хотя при составлении книги было сделано все возможное, чтобы включить в нее наиболее точные сведения, следует все же иметь в виду наличие некоторых неизбежных погрешностей в тех

сферы, которая известна под названием ионосферы; это оказало влияние на прохождение радиоволн и других подобных электромагнитных излучений, имеющих относительно большую длину волны. Более подробно этот вопрос разбирается в главе 10.

2.56. Взрыв «Тэк» сопровождался отчетливой и яркой вспышкой света, которая была видна в небе над горизонтом с Гавайских островов. Ввиду слабого взаимодействия светового излучения, ядерного излучения и кинетической энергии продуктов деления с окружающей атмосферой, имеющей малую плотность, образовавшийся огненный шар очень быстро увеличивался в своих размерах (п. 2.120 и др.). За 0,3 секунды его диаметр составлял уже 17,6 км,



Рис. 2.56. Огненный шар и красная светящаяся сферическая волна после взрыва «Тэк», произведенного на большой высоте (сфотографировано с Гавайских островов, 1250 км от места взрыва)

а за 3,5 секунды он возрос до 29 км. При этом огненный шар поднимался с большой скоростью вверх; начальная скорость его подъема составляла около 1,6 км/сек. Огненный шар был окружен сферической волной, светившейся красным светом и имевшей очень большие размеры; эта волна была, по-видимому, образована в результате прохождения фронта ударной волны через слой воздуха с малой плотностью (рис. 2.56).

2.57. Спустя около 1 минуты после взрыва огненный шар, образовавшийся при взрыве «Тэк», поднялся на высоту около 144 км и поэтому мог непосредственно наблюдаться с Гавайских островов, удаленных от центра взрыва на расстояние около 1100 км. Скорость подъема огненного шара составляла примерно 1000 м/сек, а в горизонтальном направлении огненный шар увеличивался со скоростью около 300 м/сек. Большая красная светящаяся сфера

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NOTE (by Glasstone.blogspot.com): Fig. 2.56 (Teak fireball at 100 seconds) is PRINTED UPSIDE DOWN BY RUSSIANS!

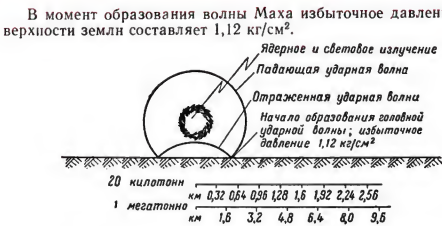


Рис. 2.51б. Развитие воздушных ядерных взрывов мощностью в 20 килотонн и 1 мегатонну (соответственно через 1,25 и 4,6 сек после взрыва)

С течением времени волна Маха удаляется от эпицентра и высота ее фронта увеличивается. Расстояния от эпицентра взрыва и высота фронта волны Маха для указанных на рисунке промежуточных времени приведены в следующей таблице:

Мощность	Высота взрыва (м)	Время после взрыва (сек)	Расстояние от эпицентра взрыва (км)	Высота фронта волны Маха (м)
20 килотонн . . . . .	528	3	1,4	55,5
1 мегатонна . . . . .	1950	11	5,1	204

Избыточное давление во фронте волны Маха составляет 0,42 кг/см², а скорость воздуха непосредственно за этим фронтом — около 290 км/час.

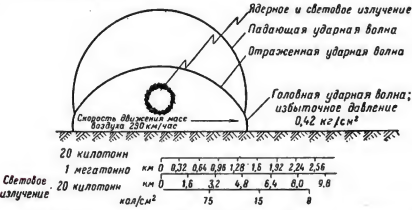


Рис. 2.51в. Развитие воздушных ядерных взрывов мощностью в 20 килотонн и 1 мегатонну (соответственно через 3 и 11 сек после взрыва)

92

могла наблюдаться в течение нескольких минут; спустя прим 6 минут после взрыва ее диаметр составлял около 960 км.

2.58. Интересным явлением, наблюдавшимся при взрыве «Тэк» было образование «искусственной зари». В течение 1 или 2 сек с момента взрыва из нижней части огненного шара появилась сияющая зари; пульсирующие снопы этого сияния распространились в северном направлении. Спустя около 1 минуты после взрыва зари могла наблюдаться в Алии, на островах Самоа, т. е. на расстоянии более 3,2 тыс. км от точки взрыва. При этом сам огненный шар ни в какое время не наблюдался непосредственно на этом расстоянии. Образование зари связывается с движением та-частиц (электронов), испускаемых образовавшимися при делении радиоактивными осколками, вдоль силовых линий магнитного поля Земли.

2.59. При взрыве «Ориндж» образовался огненный шар, и ший почти правильную сферическую форму. Этот шар увеличился в своих размерах гораздо медленнее, чем огненный шар, образовавшийся при взрыве «Тэк», который был произведен на значительно большей высоте и, следовательно, при более низкой плотности атмосферы. Вообще при взрыве «Ориндж» по сравнению со взрывом «Тэк» поведение огненного шара полностью соответствовало несколько более сильному взаимодействию излучения и кинетической энергии с окружающей средой; значительно большей плотности. Как можно было наблюдать с Гавайских островов, при взрыве «Ориндж» над горизонтом воз- ла яркая вспышка, светившаяся в течение какой-нибудь доли секунды. Примерно через 1 минуту после взрыва низко на горизонте появилось серовато-белое радиоактивное облако, которое исчезло через 4 минуты.

2.60. Ввиду наличия естественных атмосферных облаков островом Джонстон в момент взрыва «Ориндж» непосредственное наблюдение огненного шара с земли оказалось невозможным, однако такое наблюдение было осуществлено с самолетов, плавивших в этот момент над низкими облаками. Искусственные облака были менее отчетливы, чем при взрыве «Тэк», однако одна из продолжавшаяся 17 минут, наблюдалась опять-таки со стороны Алии. Во время двух взрывов, осуществленных на большой высоте над островом Джонстон, были получены данные о действии ударной волны. Максимальные давления оказались меньшими, чем можно было бы ожидать на тех же расстояниях при обычном воздушном взрыве. При взрыве «Тэк» на поверхности земли были измерены величины импульса и других параметров светового излучения; результаты этих измерений вполне соответствовали ожиданиям (п. 7.109). Характерной особенностью взрывов большой высоты является чрезвычайно сильная яркость огненного шара, который виден на больших расстояниях и способен оказывать раздражающее действие на органы зрения людей на громадных расстояниях (п. 11.72).

Но через 3 секунды после ядерного взрыва мощностью 20 килотонн огненный шар остывает настолько, что световое излучение не имеет большого значения, хотя огненный шар продолжает оставаться еще в сильно нагретом состоянии. Общее количество светового излучения в калориях, приходящееся на один квадратный сантиметр поверхности на различных расстояниях от эпицентра воздушного взрыва мощностью 20 килотонн на высоте 528 м, показано на нижней шкале рисунка (более подробно об этом говорится в главе 7). Через 11 секунд после взрыва мощностью в 1 м



Рис. 2.51г. Развитие воздушных ядерных взрывов мощностью в 20 килотонн и 1 мегатонну (соответственно через 10 и 37 сек после взрыва)

гигатонну огненный шар все еще продолжает испускать значительное количество светового излучения; испускание светового излучения происходит в течение более длительного промежутка времени, чем при взрыве меньшей мощности.

Через 10 секунд после взрыва мощностью в 20 килотонн на высоте 528 м фронт волны Маха находится на расстоянии около 4 км от эпицентра взрыва, а для взрыва мощностью в 1 мегатонн на высоте около 2 км через 37 секунд после взрыва он находится на расстоянии около 15,2 км от эпицентра. В обоих случаях избыточное давление во фронте волны Маха составляет около 0,07 кг/см², а скорость воздуха за фронтом — 64 км/час. При этих условиях будут наблюдаться незначительные повреждения многих сооружений, в том числе срыв дверей и оконных рам, разрушение крыш, повреждение штукатурки. При избыточном давлении менее 0,035 кг/см² будут выбиты из окон стекла. Световое излучение через 37 секунд после взрыва даже при взрыве мощностью в 1 мегатонну



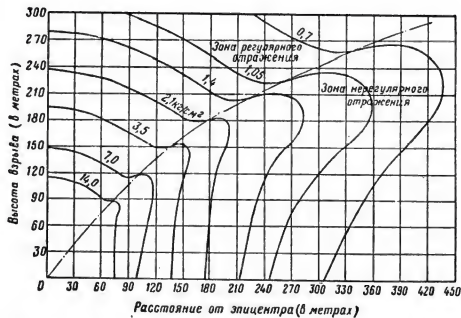
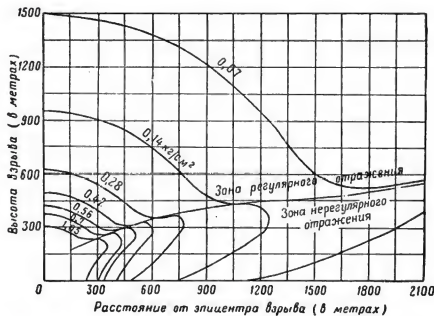
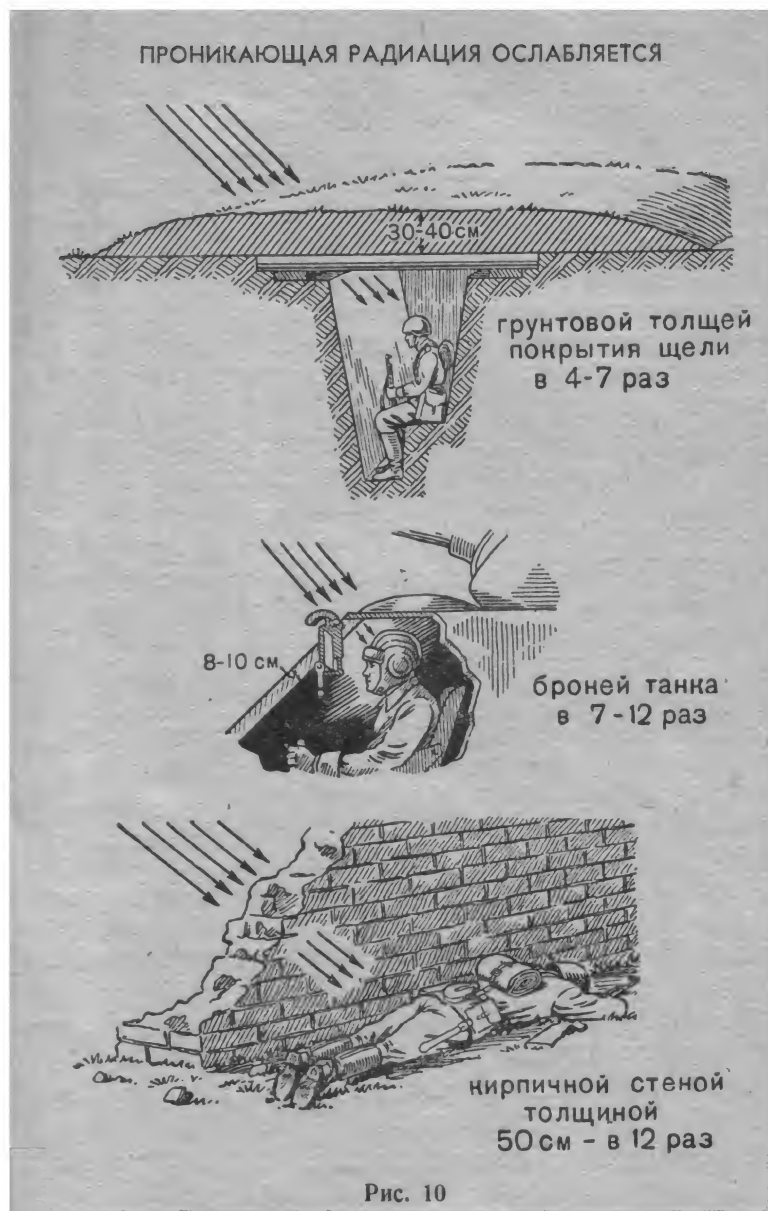
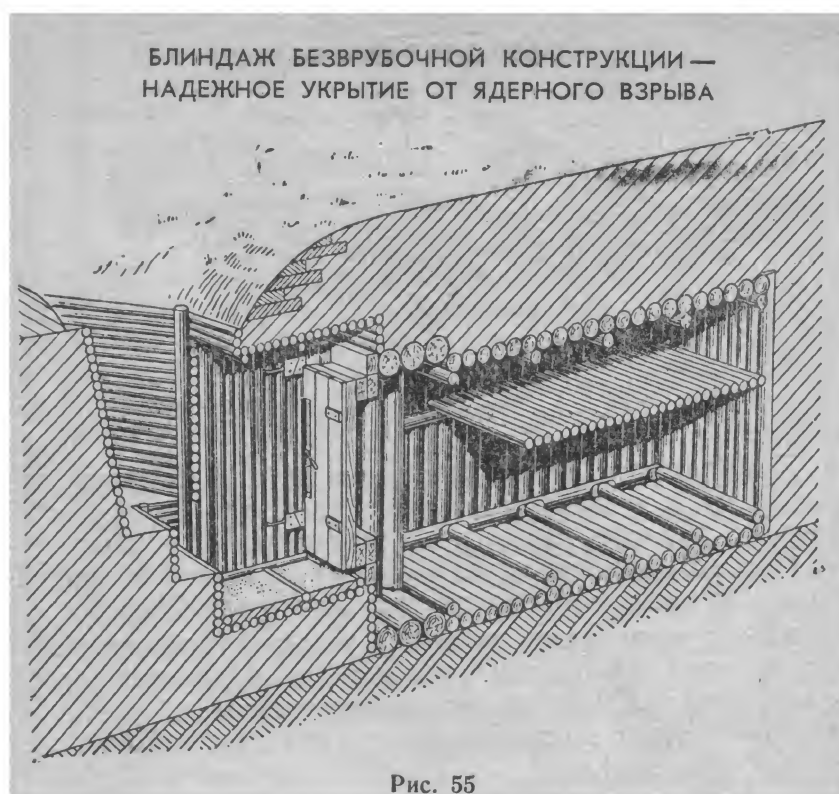
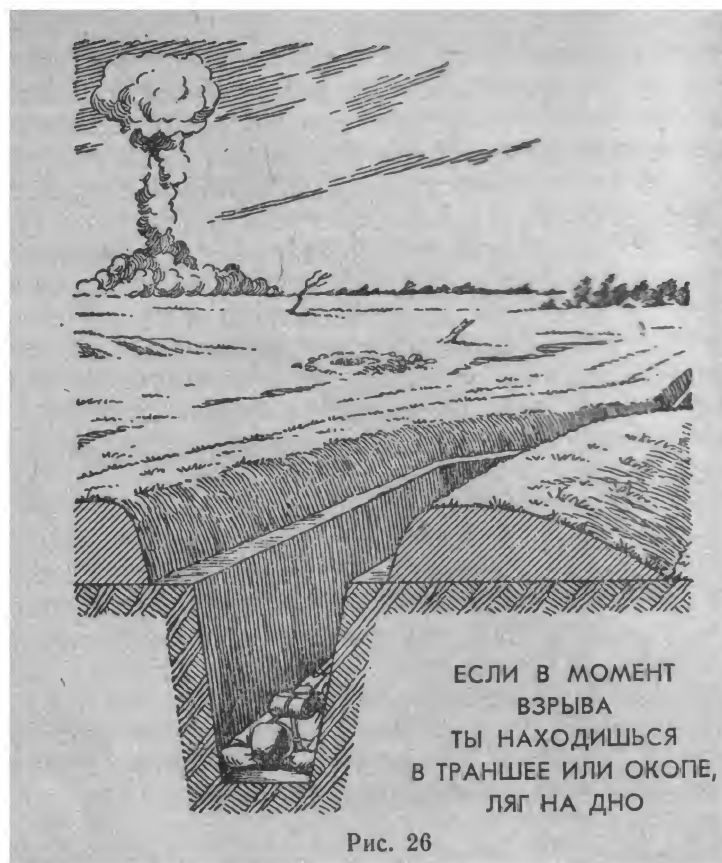


Рис. 3.67а. Максимальное избыточное давление на поверхности земли при ядерном взрыве мощностью в 1 килотонну (диапазон больших величин давления)

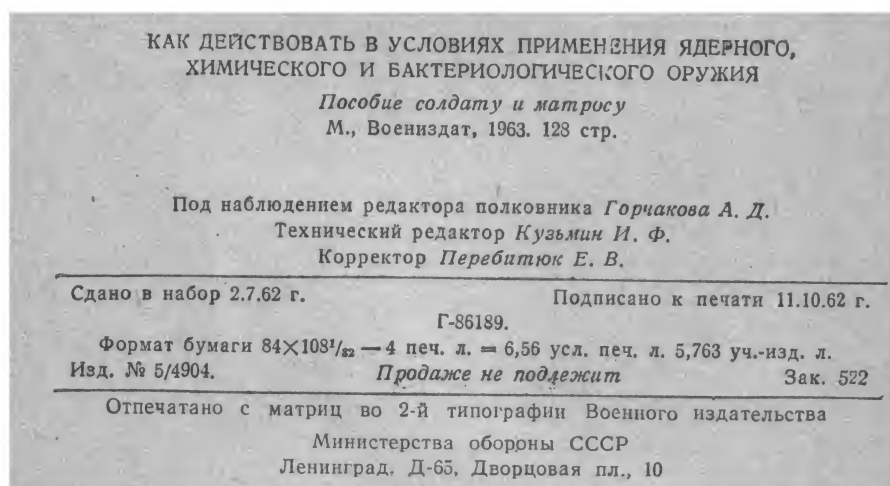




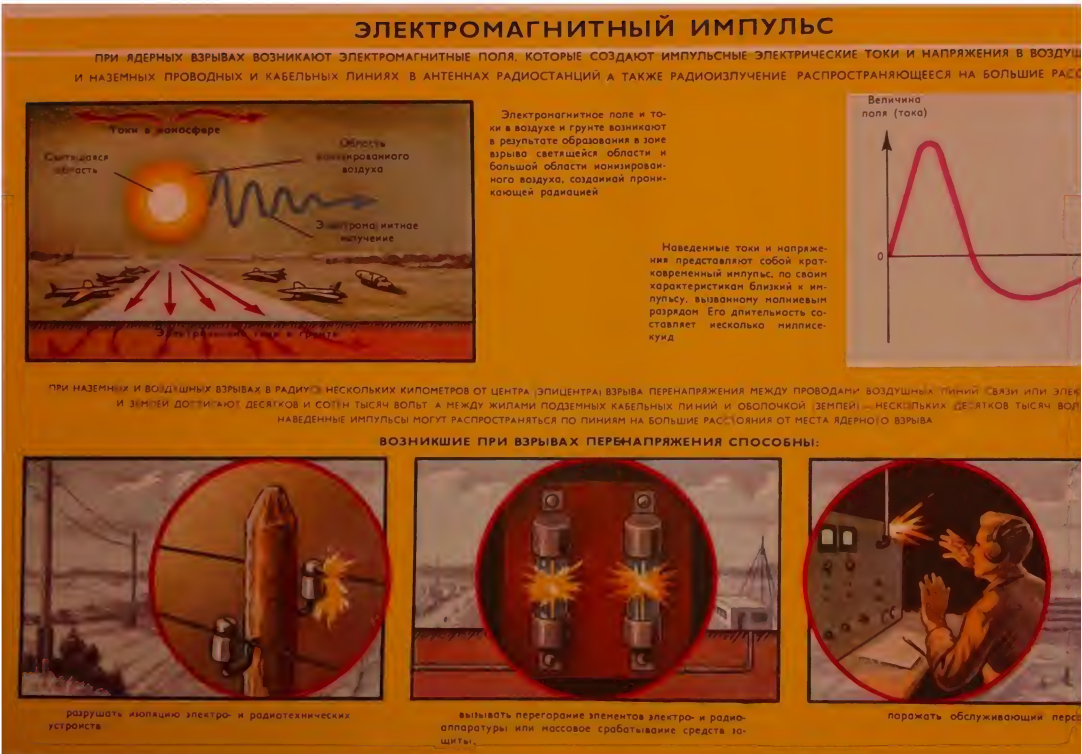




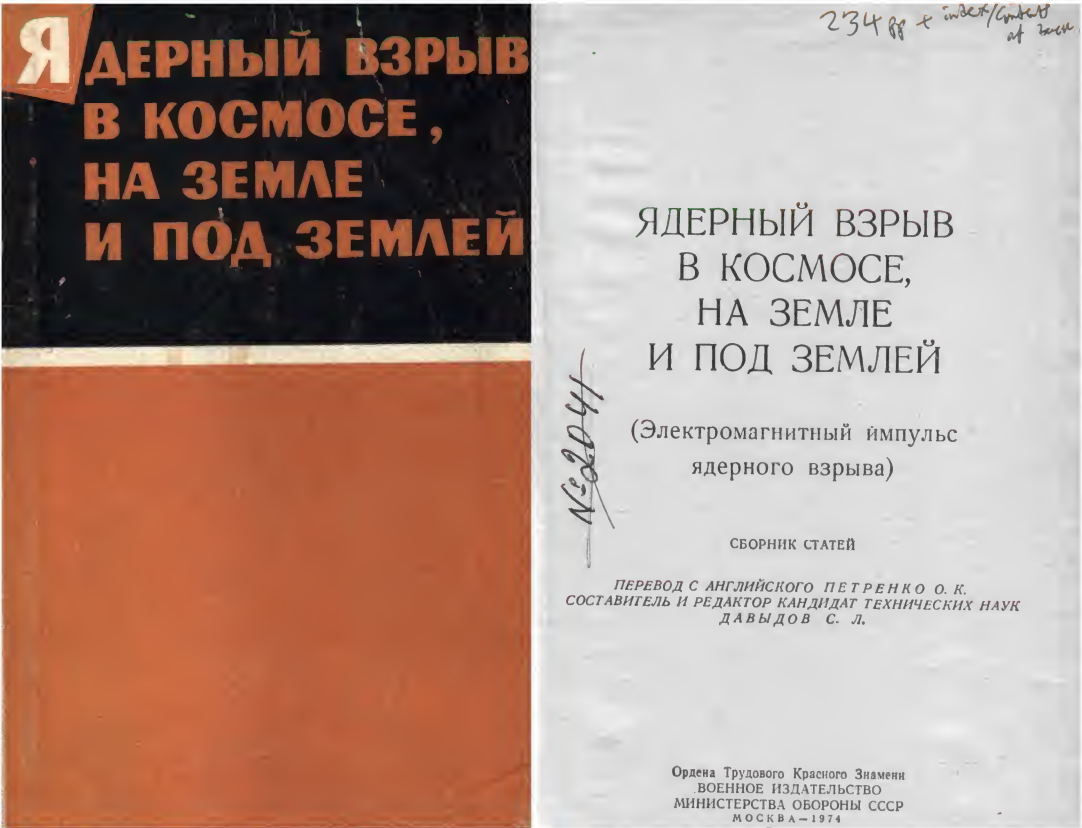




ABOVE: Russian military nuclear warfare manual published in 1963, the year after the Cuban missile crisis, *How to operate in the conditions of application of nuclear, chemical and bacteriological weapon (manual to soldier and sailor)*, by the USSR's Department of Defense, Moscow. It is 127 x 198 mm in size, with 99 illustrations and 128 pages. Sold to us by an ebayer in Kiev, Ukraine. (Since most of the information is in illustrations, only minimal use of an English-Russian dictionary is required. For more technical Russian nuclear weapons documents, the situation is similar, since the mathematics and graphs display the data as plain as day regardless of language.)



ABOVE: a 1974 USSR warning poster on the electromagnetic pulse (EMP) effect from nuclear explosions. In the same year, 1974, the USSR published a 234 pages long hardback book on the EMP, consisting of Russian translations of extracts from American research reports and journal articles on various aspects of the EMP (below). It is interesting that the EMP report extracts were edited, as for Glasstone's *Effects of Nuclear Weapons*, to bring out the most relevant information, deliberately excluding the lengthy bibliographies and irrelevant waffle that leads nowhere and is of no help (typically about half the text of the American reports).





метеорологические условия на нем типичны для тропиков. Ветер в приземном слое до высоты 600 м имел направление 110° и скорость 12—15 узлов. Нижняя кромка рассеянных пасмурных кучевых облаков (которые покрывали около 50% неба) находилась на высоте 600 м, а верхняя — в пределах 900—1200 м.

Контрольно-регистрационные пункты, оснащенные антеннами для связи и другими вертикальными конструкциями, находились на различном удалении с одной и другой стороны от взрыва. Пункты размещались вдоль прямой линии, пересекавшей центр



Рис. 1. Молния, вызванная наземным термоядерным взрывом. Пять молниевых каналов для лучшего воспроизведения обведены типографской краской

взрыва: Фотография, которая анализируется в статье, получена на острове Перри на удалении 34,7 км от центра взрыва. Направление с острова Перри на центр было почти перпендикулярно линии, проходящей через пункты регистрации. Съемка производилась с частотой 2000 кадров в секунду при времени экспозиции 100 мкс на кадр. Использовалась 16-мм камера Eastman Hi-Speed, нацеленная под углом 1°10' выше центра взрыва. Был установлен объектив Ektar с фокусным расстоянием 101,6 мм, в результате чего изображения на 16-мм кадре при удалении 34,7 км получались в масштабе 341 м/мм. Применялся светофильтр Wratten 12 и киноплёнка со специально разработанной для фотографирования ядерного взрыва эмульсией.

На рис. 1 представлен увеличенный 72-ой кадр высокоскоростного фильма. На кадре видны пять молниевых вспышек. Все они

пературы взрыва и от угла падения излучений в атмосферу<sup>1</sup>. Более детальное описание электромагнитного поля потребует параметрических исследований, что выходит за рамки настоящей статьи, цель которой — просто показать возможность использования электромагнитного сигнала для обнаружения. Поэтому укажем только приблизительно порядок напряженности электромагнитного поля для типичных условий взрыва, а затем определим примерно предельное расстояние обнаружения.

Сначала рассмотрим взрыв, который не слишком удален от поверхности Земли, температура которого составляет около 1 кэВ и при котором радиация приходит в атмосферу почти перпендикулярно поверхности Земли. Эти условия означают, что ионизация, вызываемая в атмосфере рентгеновским и гамма-излучением, столь высока, что в областях, представляющих интерес,  $\chi_e$  велика<sup>2</sup> и можно применять приближенное уравнение (52); более того,

$$\frac{2\pi}{c} \int_0^r dr' a(r', \tau) \geq 1. \quad (56)$$

Это условие означает, что по рентгеновскому излучению взрыв с тротиловым эквивалентом 1 кт произведен на высоте нескольких десятков тысяч километров от поверхности Земли, а по гамма-излучению — на высоте нескольких сот километров.

Чтобы вычислить напряженность поля излучения, сначала упростим уравнение (52). Отметим, что величина  $r'$  в подынтегральном выражении уравнения (52) может быть заменена  $r$ , расстоянием до точки наблюдения, так что интересующие нас токи заключены в тонком слое атмосферы вблизи точки наблюдения. Таким образом,

$$E_{\theta, \varphi}(r, \tau) \approx -\frac{2\pi}{c} \int_0^r dr' j_{\theta, \varphi}(r', \tau) \exp\left(-\frac{2\pi}{c} \int_{r'}^r dr'' a(r'', \tau)\right). \quad (57)$$

Теперь отметим, что для  $r'$ , достаточно близком к  $r$ , справедливо

$$\frac{2\pi}{c} \int_{r'}^r dr'' a(r'', \tau) \approx 0 \text{ и } j(r', \tau) \approx 0, \quad (58)$$

поскольку гамма- и рентгеновское излучение быстро поглощается атмосферой ниже некоторой малой высоты. Так как  $r'$  уменьшается

<sup>1</sup> Здесь эффекты, возникающие вследствие влияния ионосферы, не имеют значения, так как токи, которые создают электромагнитный сигнал, возникают ниже ионосферы. — Прим. авт.

<sup>2</sup> Для низких давлений, сильных электрических полей и энергии порядка электрон-вольт частота соударений электронов в воздухе почти не зависит от  $E$ -поля и имеет величину  $\chi_e \approx 4 \cdot 10^{12} \text{ в/см}^2 \text{ с}^{-1}$ . — Прим. авт.

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ABOVE: the 1974 USSR Russian language 234 page long hardback book of extracts from American reports on the EMP covers all mechanisms of EMP, and interestingly is focused on good approximations for analytical calculations of the EMP strength. For example, as shown in Equation 57 on page 72 (above right), for approximate calculations of the maximum EMP field strengths from the E1 or magnetic dipole mechanism in high altitude bursts, the calculation can be divided into two parts: the Compton current contribution (the non-attenuated field is proportional to the Compton current integrated along the radial line from burst to observer in retarded time), which is then multiplied by the exponential attenuation factor due to the conductivity of the air (the exponent contains the air conductivity integrated over distance in retarded time).

As a result of the Ukrainian civil war, Ukraine having been a USSR nuclear weapons site during the Cold War, some in Ukraine have been selling **Russian nuclear weapons literature on ebay**. Finding, translating and correlating the information with Russian internet hosted military sites has led to a complete analysis of what Russia knows on nuclear weapons effects, particularly Russian military nuclear weapons effects on tanks, personnel, etc. This is a big improvement on the older analysis of Russian nuclear and Russian public civil defence information, which was based on Western information such as Glasstone's *American Effects of Nuclear Weapons* (all editions of which were translated into Russian, as an unclassified general public information book). The most detailed Russian information is a limited, copy-numbered distribution (officers only): [http://militaria.lib.ru/manuals/up\\_spec-podgotovka-inzh-voisk/index.html](http://militaria.lib.ru/manuals/up_spec-podgotovka-inzh-voisk/index.html) (English translation [here](#));

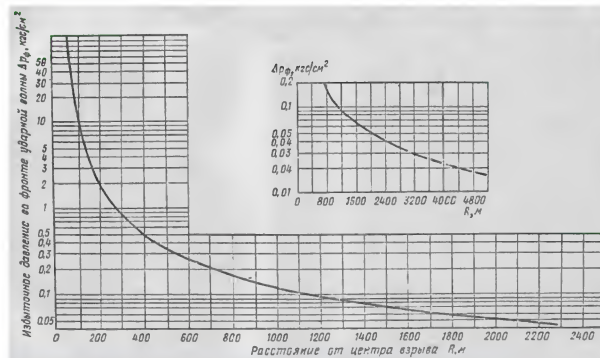


Рис. 3.4. Изменение избыточного давления с расстоянием при наземном ядерном взрыве мощностью 100 тыс. т

## ЯДЕРНОЕ ОРУЖИЕ

Экз. №

ПОСОВИЕ ДЛЯ ОФИЦЕРОВ

Издание четвертое, переработанное и дополненное

МОСКВА  
ВОЕННОЕ ИЗДАТЕЛЬСТВО  
1987

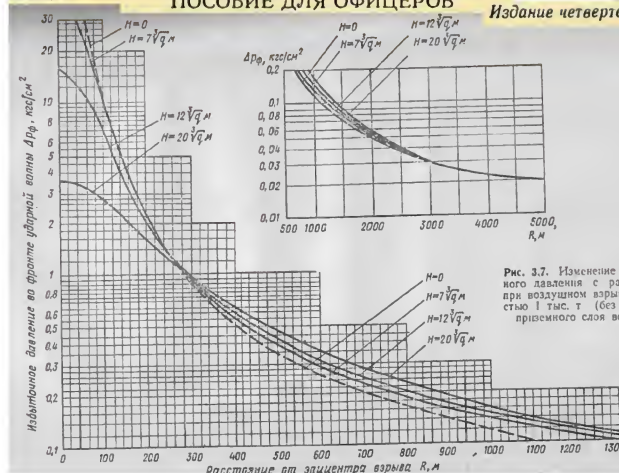


Рис. 3.7. Изменение избыточного давления с расстоянием при наземном ядерном взрыве мощностью 100 тыс. т (без прогрева приземного слоя воздуха)

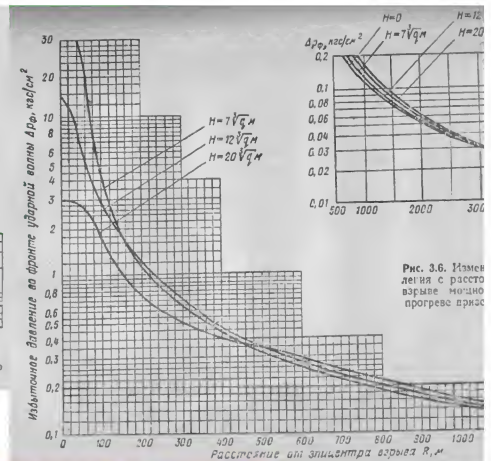


Рис. 3.6. Изменение избыточного давления с расстоянием при наземном ядерном взрыве мощностью 100 тыс. т

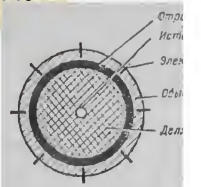


Рис. 1.3. Схема устройства ядерного оружия

Настоящее Посовие представляет собой переработанное издание «Ядерное оружие», вышедшего в 1969 г. В новом издании уточнены характеристики поражающих взрывов на личный состав войск, сооружения, объекты.

Основное внимание в Посовии уделено поражающим и воздушным ядерным взрывам. Вопросы, относящиеся к защите войск от ядерного излучения, ядерных взрывов, из Посовия исключены, по ним издаются наставления в «Григории».

Посовие предназначено для офицеров и прапорщиков войск, а также для курсантов военных училищ. Замечания и предложения по Посовию направлять в Москву, К-160, войсковая часть 31600.



EDUCATIONAL LITERATURE

Group of authors

Nuclear weapon. A Manual for Officers

The website "Military literature": militera.lib.ru

Edition: Nuclear weapons. A Manual for officers. - Moscow: Military Publishing, 1987.

Book on the site: [http://militera.lib.ru/manuals/up\\_nuclear-weapon/index.html](http://militera.lib.ru/manuals/up_nuclear-weapon/index.html)  
Nuclear weapon. Manual for officers / Fourth edition, revised and enlarged. - Moscow: Military Publishing, 1987. - 168 p.

Annotation of the publishing house: This Handbook is a revised edition of the manual "Nuclear Weapons", published in 1969. The new edition specifies the characteristics of the striking effect of nuclear explosions on personnel, armor, military equipment and other objects. The focus of the manual is on the detrimental effect of ground and air nuclear explosions. Questions related to the protection of troops from nuclear weapons and the assessment of the results of nuclear explosions are excluded from the Manual, since they are devoted to published manuals and handbooks. The manual is intended for officers and warrant officers of all types of the Armed Forces, as well as for cadets of military schools.

This book, *Nuclear Weapons - A Manual for Officers*, is the Russian equivalent not of Glasstone's *Effects of Nuclear Weapons*, therefore, but rather of Philip J. Dolan's *Capabilities of Nuclear Weapons*. It is vitally important to read and study, because it shows just what the Russians were planning to do with their nuclear weapons if war broke out. It contains extensive tables of data on the capabilities of nuclear weapons blast and initial nuclear radiation against a wide variety of military targets, aircraft, tanks and other military vehicles, with nuclear test photos of damage to these targets to help the user understand the tabulated information. Unlike the extremely long American manual, the Russian book is relatively more concise, compressing nuclear test data into tables and graphs rather than trying to formulate theoretical models and then testing their predictions against test data (the preferred American analysis method, at least since the 1972 edition of US Effects Manual EM-1). Moreover, the earlier editions of *Nuclear Weapons - A Manual for Officers*, are much longer and contain photos of damaged Russian military equipment at Russian nuclear weapons tests. The best edition is the 328 pages long 1961 edition, crammed with photos of damage caused by the 1950s Russian nuclear weapons test programme prior to the 1958 moratorium. (We will compare the 1961 and 1987 editions in detail in an update below, later in this post, when time permits.)

Russian classified Nuclear Weapons Effects Publications and the East-West Wiki schism over the Swan device design

The civil war between pro-Westerners in the Western parts of Ukraine, and generally pro-Russian immigrants in the East (near the largely imaginary border between Russia and Ukraine) has led some Ukrainians selling off cold war era (1955-1987) Russian military nuclear weapons effects manuals, printed with "Official Use Only" and serial number in the top right of the outer cover and title pages. These are worth a blog post since they are the Russian equivalent to the classified American *Capabilities of Nuclear Weapons* and *Nuclear Weapons Employment* manuals. Formerly we only had access to unclassified Russian publications, mainly Russian civil defence (rather than military defence) manuals, the nuclear effects data in which was mostly unclassified Western literature.

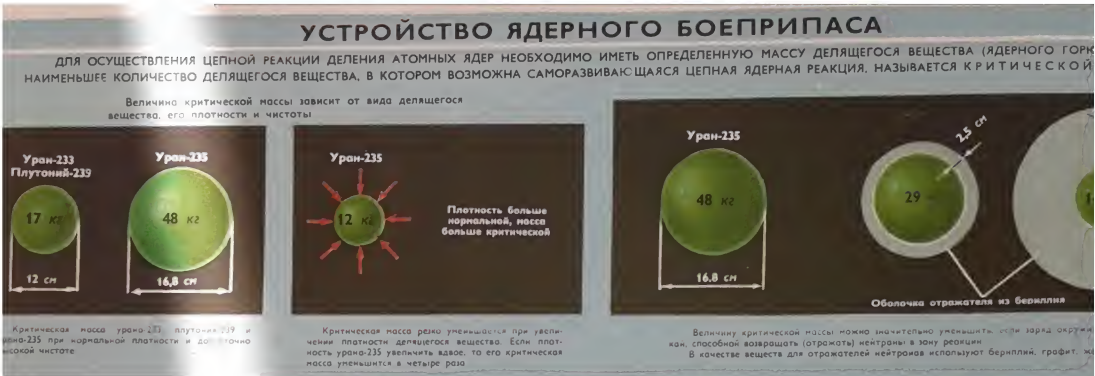
Before we get into the details, I want to draw attention to a key distinction between the Russian language and English language Wikipedia sites on Nuclear Weapons: they have differing designs shown for the American 1956 Swan nuclear weapon (tested that year as the 15 kt Redwing-Inca shot). This is of importance because Swan was a very special miniaturised warhead of use in tactical weapons and also as the fission (primary) stage in thermonuclear weapons.

According to the Russian Nuclear Weapons Wikipedia article (but not the American one), the name Swan appears to reflect the radial symmetry of the device itself, which is one point implosion (the American article claims it is two point implosion) as follows:



Swan (15.2 kt Redwing-Inca) design, according to Russian (not English) "Nuclear Weapons" Wiki

The Swan fission implosion design is allegedly a heart-shaped, one-point implosion fission weapon, with a radial cross-section resembling the curve of the neck and head of swan, according to animation on the Russian Wiki article, "Nuclear Weapons". This differs substantially from the design on the English "Nuclear Weapons" Wikipedia article! There is a special lens system of explosives: the outer shell which ignites is a fast-burning explosive like TNT, whereas the inner region of the heart shaped shell is filled with slower burning explosive, so that wave is shaped to converge around the fissile core, despite the implosion having been initiated at one point only! The Swan device was successfully tested in 1956 as the 15.2 kt Redwing-Inca shot, which notes that Swan was one-point safe (which clearly is not strictly true for the 15.2 kt Redwing-Inca shot). Swan design, the whole point of which depends on a single point of high explosive initiation! However, the Russian article's one-point implosion Swan illustration is an ingenious design and if the "one point implosion" at the base of the heart was shielded/protected from accidental impact-absorbers, then the remainder of it would be one-point safe. While the outer heart-shaped design of the high explosive system may make sense, note that the design above has the fissile core system placed far too close to the top of the heart: there is too little thick material to the right of the core in the lower sequence of implosion images) to produce uniform compression. The Russian graphic is unreliable for this reason. You can get a single detonator one-point implosion to work with a heart shaped TNT charge, but you need the fissile material to be (so that it receives similar impulsive impulses from all sides, at the same time!). The mixture of crazy ingenuity, and slip shod intention to important details, permeates a great deal of Russian nuclear weapons information, and we will encounter further examples of this. Again, Russian illustration of the Swan device is in any way accurate or has any connection to the actual Swan design; I'm merely commenting on an interesting difference between Russian and American ideas.



Excerpt from a 1974 USSR nuclear weapons design poster showing critical masses under different conditions.



1974 USSR nuclear weapons effects poster depicting capabilities of a 1 megaton explosion.



USSR troops train for nuclear weapons fallout monitoring and decontamination. Unlike America and Britain, which had separate Radiax survey meters (meters with the ionisation chamber or miniature geiger counter tube in the main boxes for measuring 0.1-300 R/hour gamma dose rates, for use in the first 2 weeks after an explosion) and contamination meters with probes on cables (for use during decontamination more than 2 weeks after an explosion, measuring dose rates below 500 mR/hour), the Russians instead used a single instrument which covers the entire range of dose rates by using multiple geiger tubes in the probe unit.



Russians practice duck and cover against nuclear explosions despite their Marxist overseas propaganda units hypocritically sneering at Westerners doing the same!

Министерство Российской Федерации по делам гражданской обороны, чрезвычайным ситуациям и ликвидации последствий стихийных бедствий

открытые траншеи уменьшают радиус поражающего действия в 2 раза, а в 3 раза. При нахождении в подземных прочных сооружениях на глубине люди не поражаются даже если это сооружение находится в эпицентре ядерного взрыва (рис. 1.8).

Защитными свойствами от действия ударной волны обладают также и БМП.

При невозможности использовать защитные свойства различных сооружений следует применять элементарные меры защиты. Так как для незащищенного человека наибольшую опасность представляет скоростной напор, то целесообразно ударной волне лечь на землю лицом вниз, головой или ногами в сторону, в этом площадь поперечного сечения уменьшается примерно в 10 раз, а в скоростного напора будет минимальным.

Воздействие скоростного напора снижают различные углубления, воронки и др.) или невысокие прочные стенки, или и другие предметами можно укрыться.

ГРАЖДАНСКАЯ ОБОРОНА

Учебник

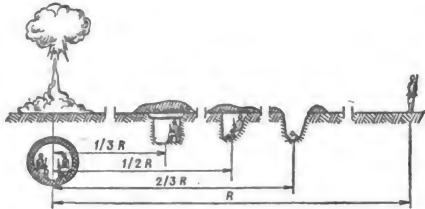


Рис. 1.8. Защитные свойства полевых фортификационных сооружений от воздушной ударной волны ядерного взрыва

Световое излучение ЯВ представляет собой поток лучистой энергии фиолетовой, видимой и инфракрасной областях спектра электромагнитных волн. Оно возникает сразу после взрыва совместно с образованием светящейся гомотермического шара и распространяется со скоростью 3·10<sup>8</sup> км/с. Из-за этого, время необходимое для прохождения лучистого потока от точки взрыва до объектов, находящихся даже на расстоянии десятков километров от места взрыва, практически равно нулю.

Световое излучение для ядерных взрывов мощностью более 10 кт, одновременно с ударной волной и проникающей радиацией, имеет большой радиус действия и открыто расположенного личного состава и различных легко возгораемых объектов.

Источником светового излучения является светящаяся область ЯВ. Форма светящейся области зависит от вида взрыва, при высоком взрыве она близка к сферической. Светящаяся область низкого воздушного взрыва деформируется ударной волной, отраженной от поверхности земли, при сферическом сегмента. При наземном взрыве светящаяся область соприкасается с поверхностью земли и имеет форму полусферы, радиус которой в 1,2...1,3 раза больше радиуса огненного шара воздушного взрыва той же мощности.

2014 г.

2014 official Russian Civil Defense Manual Extract: nothing fundamental has changed since the Cold War. Compare Figure 1.8 on page 42 (above right) to the similar earlier illustration in this blog post from the 1950s Russian nuclear test data (linked here for your convenience) showing survival in deep tunnel shelters near ground zero and survival in good trenches close to ground zero!

13 November 2017 update: detailed review of the limited distribution 1961 and 1987 editions of the Russian effects data manual, Nuclear Weapon - A Manual for Officers





Рис. 18. Конденсационные облака, обозначаемые в зоне разрежения ударной волны



Рис. 28. Облако подводящего ядерного взрыва (султан). На осверглости не



Рис. 20. Начало образования облака возмущенного электронного излучения, из центра поперечного сечения облака излучение поднимается столб пыли



Рис. 45. График изменения давления во фронте удара

Illustration of pressure changes in shock wave then diffracts on passing over a hill: the overpressure is increased by a factor of 2.5 when hitting the 45 degree slope and is reduced by a factor of 2 on the other side of the hill, due to the expansion of the shock wave.



Рис. 89. Пассажирский самолет, получивший слабые повреждения (обжигание обшивки)

Russian nuclear test effects on aircraft: denting of nose (above) and damage to rudder and tail stabilisers (right).



Рис. 90. Тяжелый бомбардировщик, получивший сильные повреждения



Рис. 91. Реактивный истребитель, получивший сильн

Undercarriage damage to a Russian MIG-15 jet fighter at a Russian nuclear weapon test.



Рис. 94. Средний танк, получивший сильные повреждения.  
Башня танка сожжена

Severe damage to tanks at a Russian nuclear weapon test. Turret ripped off (above) during displacement (tank came to rest upright). Tank turned on side (right).



Рис. 93. Средний танк, получивший сильные повреждения



Рис. 92. Реактивный истребитель, разрывающийся под действием ударной волны

MIG-15 fighter totally wrecked (severe damage) by a Russian nuclear weapon test.

Russian MIG-15 fighter jets and tanks were exposed to nuclear tests. Most of the content is military effects. Note that invading forces, while actually on the move in offensive attacks and invasions, are highly vulnerable to nuclear weapons. *For example, the Russian MIG-15 fighter jets and tanks were exposed to nuclear tests. Most of the content is military effects. Note that invading forces, while actually on the move in offensive attacks and invasions, are highly vulnerable to nuclear weapons. For example, the Russian MIG-15 fighter jets and tanks were exposed to nuclear tests. Most of the content is military effects. Note that invading forces, while actually on the move in offensive attacks and invasions, are highly vulnerable to nuclear weapons.* like neutrons and the wind sandstorm blast "precursor" for detonations above a dark sandy surface (they are more vulnerable than *civilians in modern concrete buildings*, who had a 50% survival rate at just 0.2 mile from ground zero according to Glasstone). The opposite is true for troops in defensive dugouts, which are relatively safe from blast, heat and radiation. **Therefore, nuclear weapons are an effective defensive weapon that can stop invasions, e.g., to prevent an enemy invasion of a peaceful country.** They could have deterred the invasion of Belgium in 1914, the invasion of Poland in 1939, the invasion of Russia in 1941, of Afghanistan in 1979 and of Kuwait in 1992. precisely the kind of military invasions that resulted in all the world wars and major wars of history.

## Ядерное оружие

## Пособие для офицеров

(Nuclear weapon  
Manual for officers)




Рис. 95. Самоходно-артиллерийская установка, получившая сильные повреждения




Рис. 96. Грузовой автомобиль, получивший слабые повреждения




Рис. 97. Трактор, получивший слабые повреждения




Рис. 98. Грузовой автомобиль, получивший средние повреждения




Рис. 99. Полностью разрушенный грузовой автомобиль




Рис. 100. Опрокинутая и сильно поврежденная тяжелая пушка




Рис. 101. Опрокинутая и сильно поврежденная тяжелая пушка

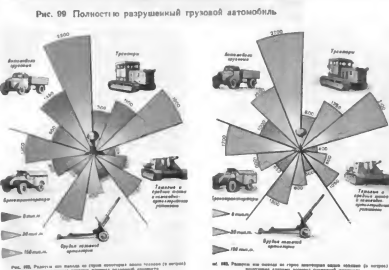


Рис. 102. Диаграмма, показывающая зоны поражения различных объектов при ядерных взрывах. Включает данные для танков, артиллерийских установок, грузовиков, тракторов, бронетранспортеров, реактивных истребителей, реактивных бомбардировщиков и поршневых самолетов.




Рис. 103. Маленький домик, получивший слабые повреждения




Рис. 104. Маленький домик, получивший слабые повреждения

**Таблица 19**  
**Радиусы зон выхода из строя вооружения и техники, расположенных вне укрытий при ядерных взрывах (в м)**

Вид вооружения и техники	Вид взрыва	Мощность взрыва, тыс. т														
		1	3	5	8	10	15	20	30	40	50	75	100	150	200	300
Тяжелые и средние танки и самоходно-артиллерийские установки	Наземный и воздушный	200	290	350	400	430	500	550	600	650	750	850	950	1050	1150	1350
Легкие танки и самоходно-артиллерийские установки	Наземный и воздушный	250	360	450	500	520	600	700	800	850	900	1050	1150	1300	1450	1700
Орудия наземной артиллерии	Наземный и воздушный	250	360	450	500	520	600	700	800	850	900	1050	1150	1300	1450	1700
Орудия зенитной артиллерии	Наземный	300	425	500	600	650	750	800	900	1050	1150	1300	1400	1600	1750	2000
Автомобили грузовые	Воздушный	350	500	600	700	750	850	950	1100	1200	1300	1500	1650	1850	2000	2350
Тракторы	Наземный	425	600	750	850	900	1050	1150	1350	1450	1550	1800	2000	2300	2500	2800
Бронетранспортеры	Воздушный	525	750	950	1000	1100	1250	1400	1600	1750	1900	2100	2400	2700	3000	3400
Реактивные истребители	Наземный	340	500	600	700	750	850	950	1100	1200	1300	1500	1600	1800	2000	2400
Реактивные бомбардировщики	Воздушный	380	550	650	800	850	950	1000	1250	1300	1400	1600	1750	2100	2200	2500
Поршневые самолеты	Наземный	250	360	450	500	520	600	700	800	850	900	1050	1150	1300	1450	1700
	Воздушный	320	450	550	650	700	800	850	1000	1100	1200	1350	1500	1700	1900	2200
	Наземный	500	725	850	1000	1100	1250	1400	1600	1750	1900	2200	2400	2600	3000	3400
	Воздушный	600	850	1050	1200	1300	1500	1600	1850	2000	2200	2500	2800	3150	3450	4000
	Наземный	900	1300	1550	1800	1950	2300	2500	2800	3100	3300	3800	4200	4800	5300	6000
	Воздушный	1000	1500	1750	2000	2200	2500	2800	3100	3400	3700	4250	4750	5200	6000	6800
	Наземный	1400	2000	2400	2750	3000	3400	3800	4300	4700	5100	5800	6400	7800	8000	9200
	Воздушный	1550	2200	2600	3000	3300	3800	4100	4700	5300	5500	6500	7000	8300	9000	10200

Above: the 1961 Russian *Nuclear Weapon - A Manual for Officers* book contains an extensive collection of Russian nuclear test damage photos on all kinds of military equipment, fortifications, and some Russian type houses to illustrate the definitions of damage criteria in data tables which cover nuclear weapon yields of 1 kiloton to 300 kilotons. The book even includes a chapter on "Some issues of organizing and conducting military operations in the conditions of the use of nuclear weapons" which discusses the use of tactical nuclear weapons with coloured diagrams (below):

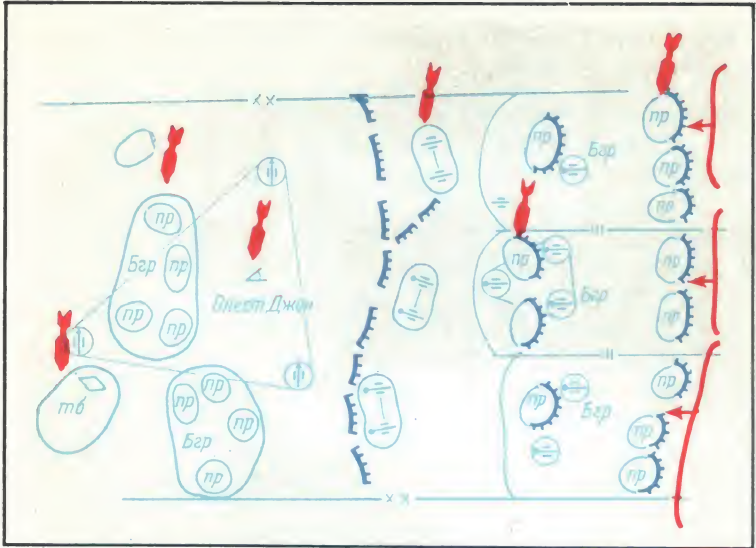


Рис. 169. Возможные объекты ядерных ударов в Наступлении

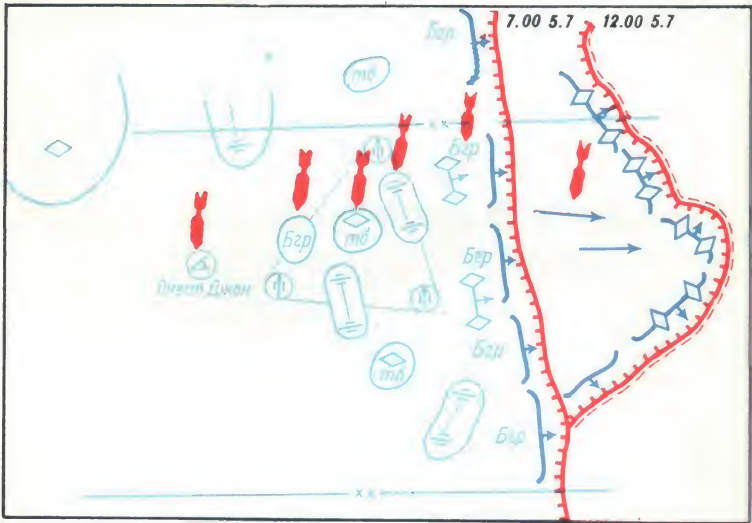
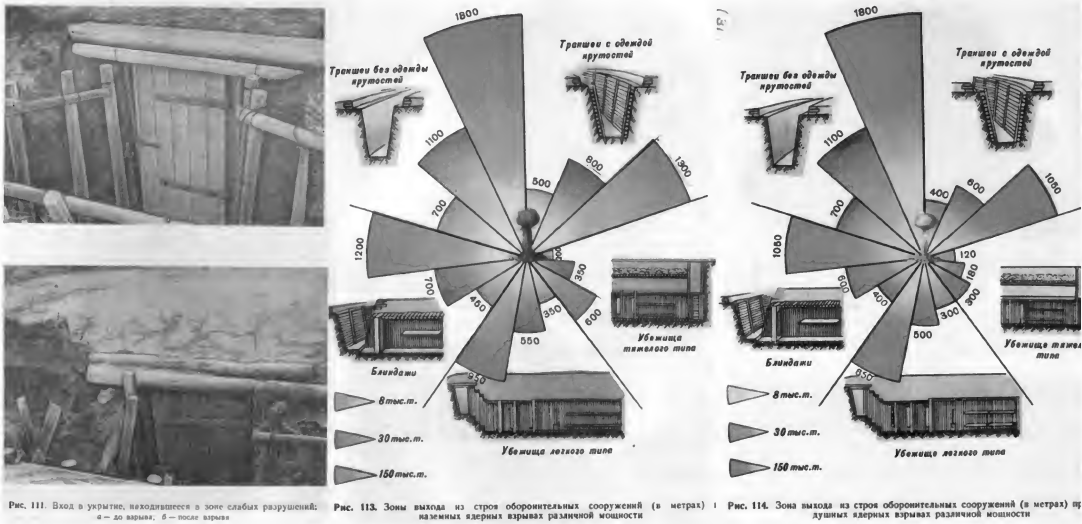


Рис. 170. Возможные объекты ядерных ударов в обороне

Use of tactical nuclear weapons with regards to offensive and defensive forces in the 1961 Russian restricted distribution book, *Nuclear Weapons - A Manual for Officers*.





1961 Russian "Nuclear Weapon - Allowance for Officers" manual gives detailed Russian nuclear test data on the effects on field defences, such as trenches of various types and shelters.

Раднусы зон выхода из строя оборонительных сооружений при ядерных взрывах (в м)

Вид сооружения	Вид взрыва	Мощность взрыва, тыс. т															
		1	3	5	8	10	15	20	30	40	50	75	100	150	200	300	
Траншеи без одежды крутостей	Наземный и воздушный	350	500	600	700	750	850	950	1100	1200	1300	1500	1600	1800	2000	2350	
Траншеи с одеждой крутостей	Наземный Воздушный	250 200	360 290	450 350	500 400	520 430	600 500	700 550	800 600	850 650	900 750	1050 850	1150 950	1300 1050	1450 1150	1700 1350	
Блиндажи	Наземный Воздушный	225 200	320 290	380 350	450 400	480 430	550 500	600 550	700 600	770 650	850 750	950 850	1050 950	1200 1050	1300 1150	1500 1350	
Убежища легкого типа	Наземный Воздушный	180 160	250 230	300 280	350 300	380 350	440 400	480 440	550 500	600 550	650 600	750 700	800 750	950 850	1050 950	1200 1050	
Убежища тяжелого типа	Наземный Воздушный	115 55	160 80	190 100	250 120	280 130	300 140	350 150	390 180	420 200	475 210	525 240	560 300	600 330	650 330	750 380	

Таблица 21

Рис. 129.



Рис. 116. Автомобиль в укрытии, который облетает при взрыве. Shallow open trenches provide protection against the blast wind drag effect, which simply blows over the top.

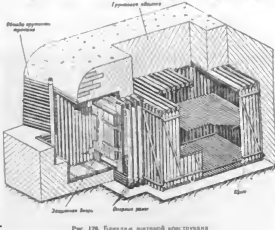


Рис. 128. Блиндаж легкой конструкции.

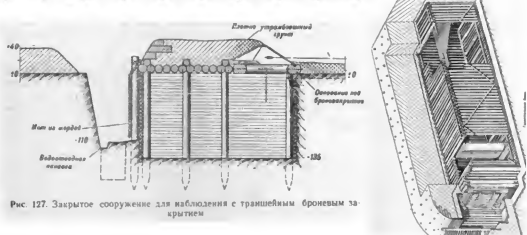
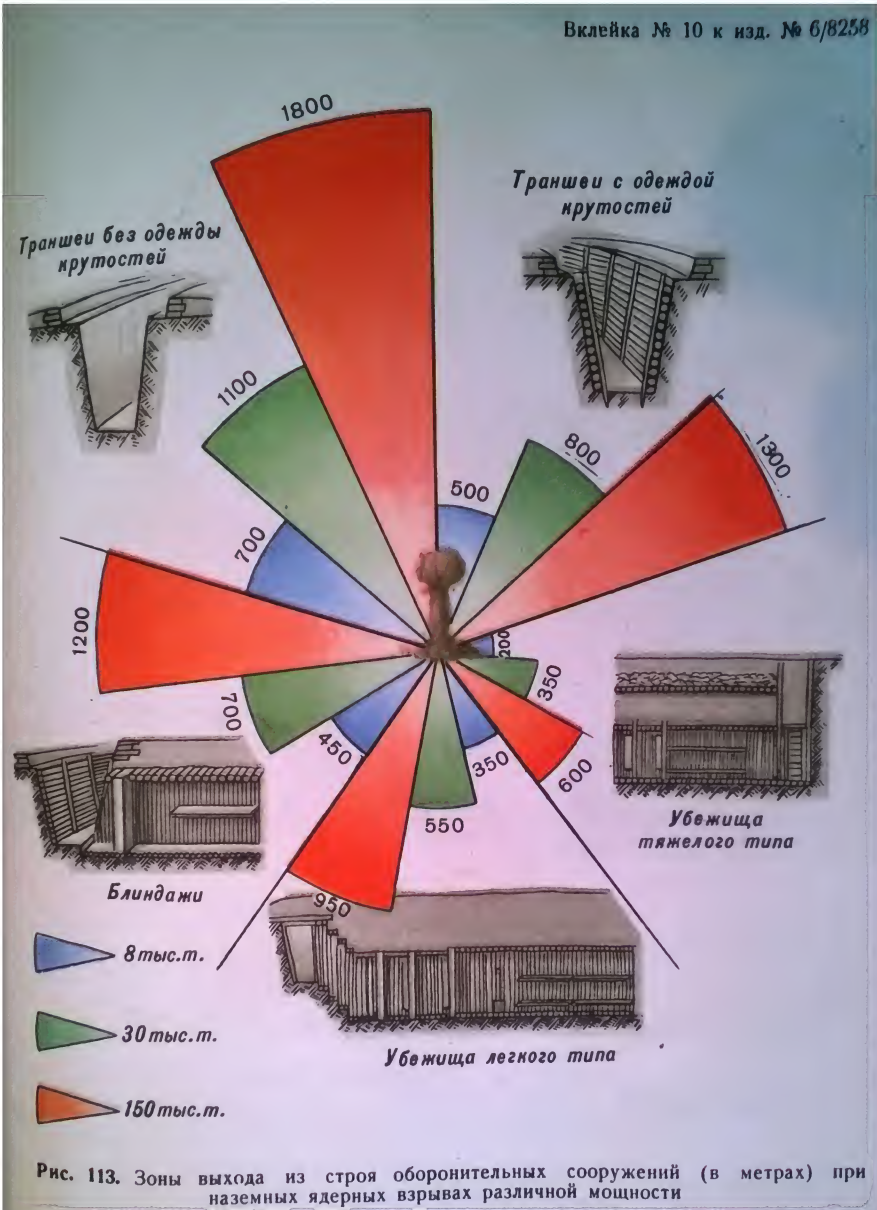


Рис. 127. Закрытое сооружение для наблюдения с траншейным броневым закрыванием.

Above: the 1961 Russian manual *Nuclear Weapon - A Manual for Officers* also includes vitally important data on the survival of field defense fortifications which are similar to improvised civil defense shelters and countermeasures, such as shallow pits for preventing blast wind displacement damage to vehicles, and wood pole and earth shelters, as well as the good old trench type shelters which prevented rapid knockout blows by high explosives in World War I.



1961 Russian *Nuclear Weapon* book: field fortifications damage distances chart in original colour: red is for 150 kilotons, green for 30 kilotons and blue for 8 kilotons yield. (This is a photo. The small scanned PDF extracts file is in greyscale. Eventually, the entire 1961 manual will be scanned in original colour, but that will take time, and the extracts on Internet Archive will do for the present, as the data is also contained in tables. The coloured diagrams are for quick, emergency use in a war.)

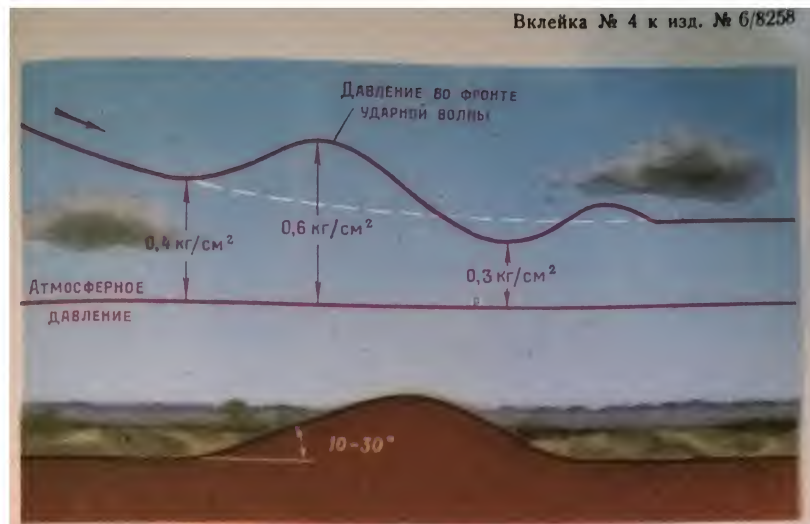


Рис. 44. График изменения давления во фронте ударной волны при прохождении ее через высоту с крутизной скатов 10—30°

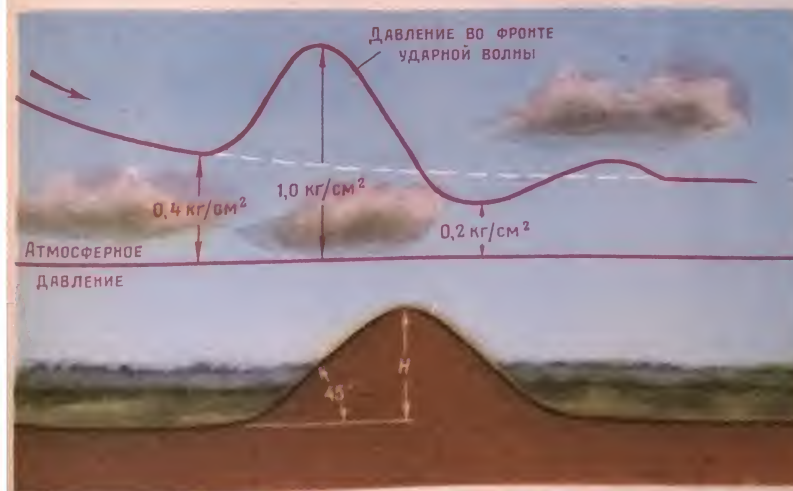


Рис. 45. График изменения давления во фронте ударной волны при прохождении ее через высоту с крутизной скатов 45°

1961 Russian book colour illustration of the terrain effects on blast overpressures: if you are on a hill with a view of a nuclear explosion, the blast is reflected and there is an increase in overpressure (this is partly due to the conversion of dynamic pressure into overpressure, and partly the doubling of pressure that momentarily occurs as the reflected shock front reflects and collides with further incoming compressed air). But if you are on the opposite side of the hill to the explosion, you get a reduced blast overpressure (compared to unobstructed terrain), due to diffraction (which is the opposite of reflection).

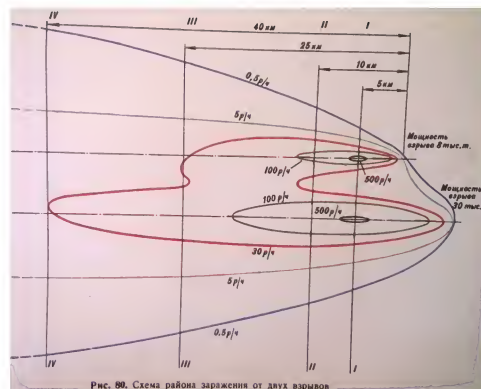
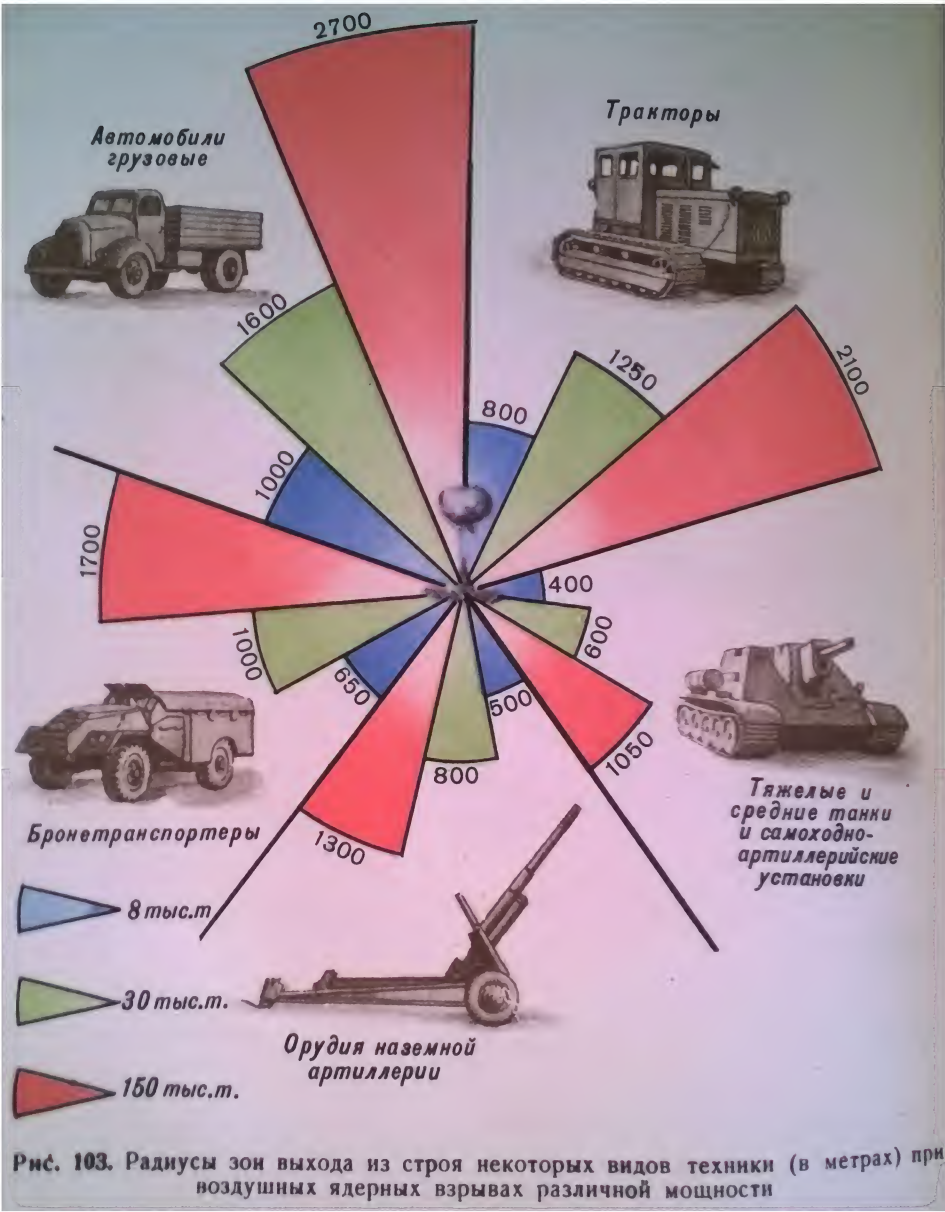
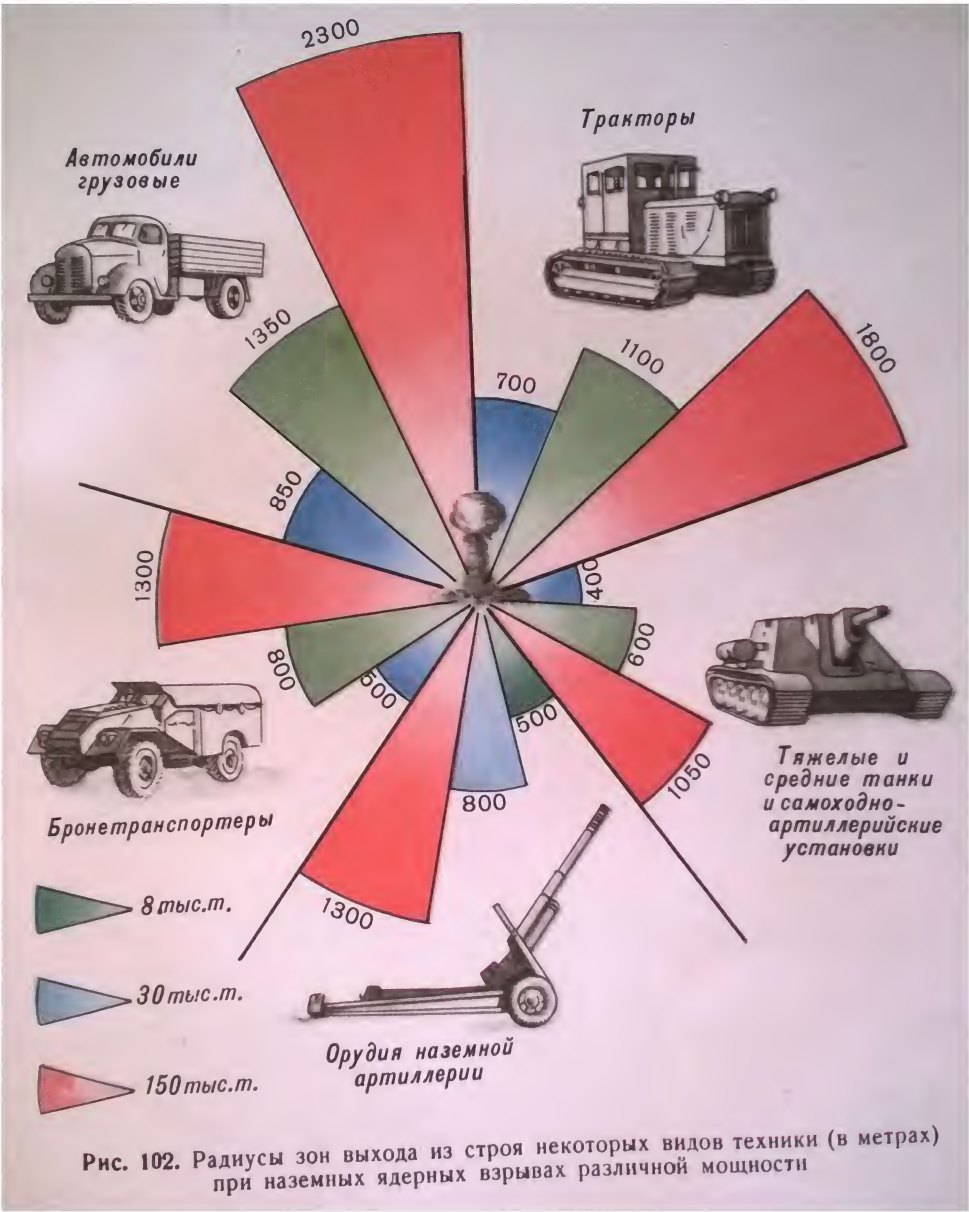


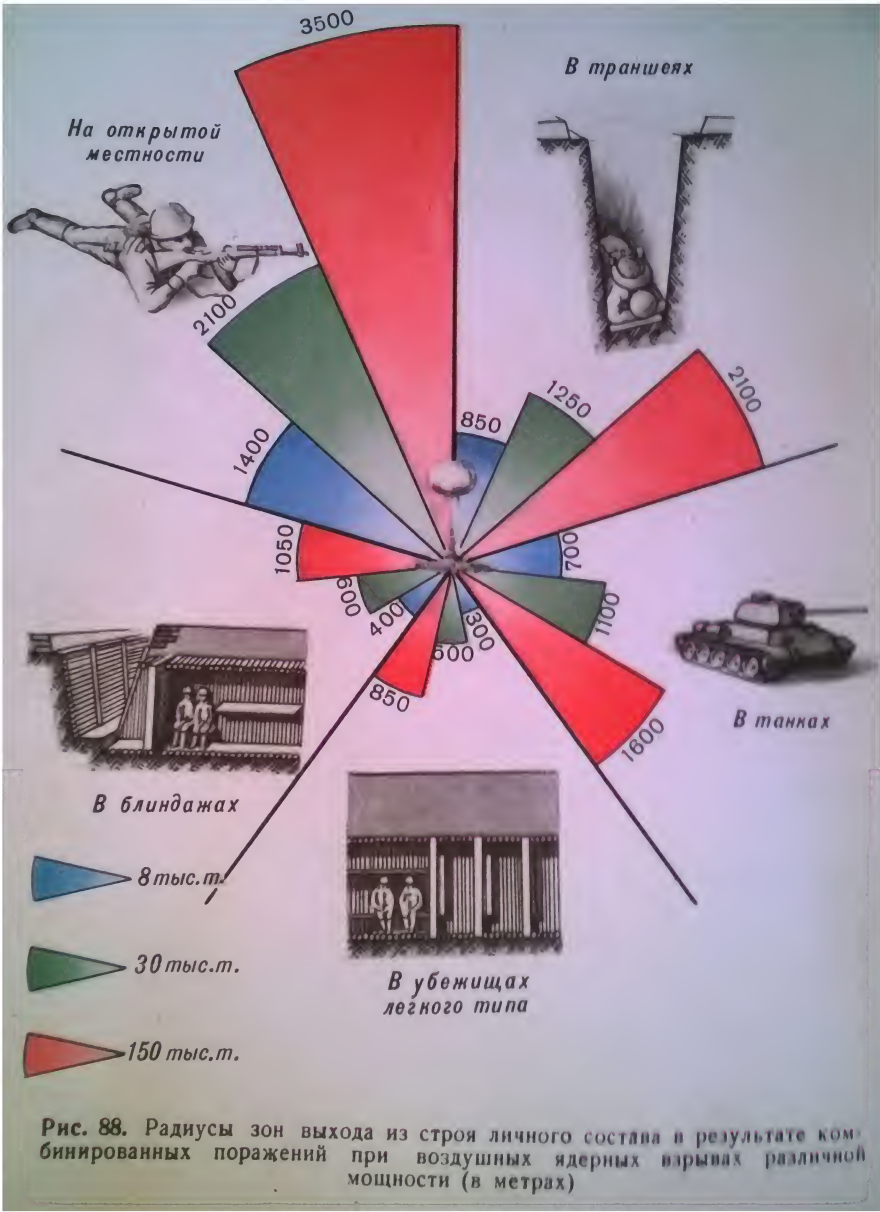
Рис. 89. Схема района заражения от двух взрывов

1961 Russian *Nuclear Weapons* book illustration of fallout overlap from 8 and 30 kiloton tests; note the downwind "hotspots" of 500 R/hour from each weapon. This is based on research from original Russian nuclear test data.



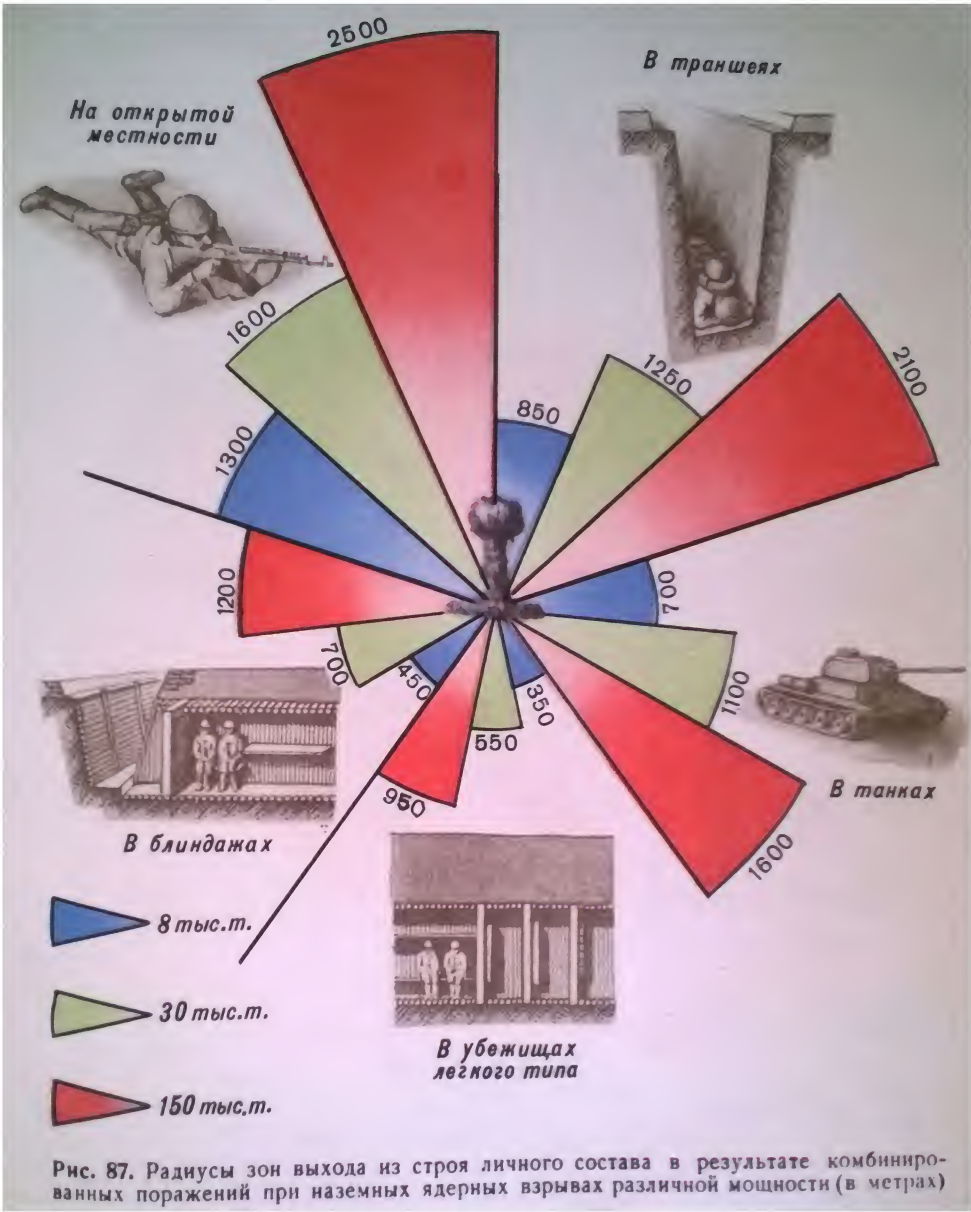






1961 edition of the USSR Nuclear Weapon Manual for Officers military effects of tactical weapons A





1961 edition of the USSR Nuclear Weapon Manual for Officers military effects of tactical weapons B

1961 Russian Nuclear Weapons book poster-style illustrations of damage to military field equipment. None of these full colour plates are reprinted in the much briefer 1987 edition of the manual, so it appears that they were colour photos of military posters included in the longer 1961 edition.



Above: Comparison of the 1961 and 1987 editions of the USSR Nuclear Weapon Manual for Officers. Both the 1961 and 1987 editions of *Nuclear Weapons - Manual for Officers* are hardcover published by the USSR military publishing agency Voenizdat, in Moscow, but they are very different in superficial appearance. The 1961 book is 328 pages long and 150x227 mm with colour illustrations, whereas the 1987 edition is just 168 pages long with no colour and 145x220mm. (You almost get the impression just by comparing these editions of the book that in 1961 the USSR's star was rising with Gagarin that year becoming the first person in space and Khrushchev's peace shattering 50 megaton nuclear test, while in 1987 it was on the wane due to the concessions made in order to agree to the INF treaty signed by Reagan and Gorbachev in that year.)

UPDATE (4 December 2017):

Таблица 3

Ориентировочные значения световых импульсов, вызывающие обугливание, горение или оплавление некоторых материалов (при взрыве мощностью 50 тыс. т) 50 KILOTONS			
Сосновые доски, окрашенные в черный цвет = Blackboards painted in black	Световой импульс (в ккал/см²), вызывающий		
	обугливание CHARRING	горение COMBUSTION	начало оплавления BEGINNING REFLOW
Наименование материала = Name of the substance Сосновые доски, окрашенные в белый цвет = Whiteboards painted in white			
Березовые доски сухие = BIRCH BOARDS, DRY			
Березовые доски сухие = Birch boards, dry . . . . .	10	50	—
Сосновые доски сухие = Conifer boards, dry . . . . .	7	50	—
Сосновые доски, окрашенные в черный цвет	—	30	—
Сосновые доски, окрашенные в белый цвет	40	150	—
Древесная кора сухая . . . . .	3	25	—
древесная кора сухая = DRY BARK			
Стекло оконное = WINDOW GLASS			
Стекло оконное = WINDOW GLASS . . . . .	—	—	700—800
Красная черепица . . . . .	—	—	20
Алюминий толщиной 3 мм . . . . .	—	—	140—170
Железо толщиной 1 мм . . . . .	—	—	260
Железо толщиной более 2 мм . . . . .	—	—	750
Медь толщиной 2 мм . . . . .	—	—	370
Фольга медная толщиной 0,1 мм . . . . .	—	—	30
= Foil Copper, Thickness 0.1 mm			

English translations of examples of thermal data from the 1961 Russian manual, for 50 kt nuclear test (TABLE 3). Above: as a test of the source of the Russian data tables, Table 3 in the 1961 edition shows very different data on thermal effects to Glasstone's *Effects of Nuclear Weapons*. It gives Russian test data from a 50 kiloton burst, showing that glass only begins to melt at 700-800 cal/cm², while white boards only ignite at 150 cal/cm² (although they temporarily smoke or char at 40)! (Note that in the Russian table, kкал/см² = cal/cm².)

The key data from the 1969 Russian *Nuclear Weapons* manual has now been added between the 1961 and 1987 editions, here. The 1969 edition is actually longer than even the 1961 edition, with 388 pages! Although at first glance the 1969 air burst blast overpressure curves look similar to those in the 1987 edition, there are subtle differences. In addition, it contains interesting differences in the presentation of EMP capabilities. See the section on pages 174-6 of the 1969 edition:

"§ 22. поражающее действие электромагнитного импульса и способы защиты от него":

§ 22. The damaging effect of the electromagnetic pulse and the methods of protection against it.

(This post is under revision. To be updated with detailed data summaries from the Russian nuclear testing based *Nuclear Weapons - A Manual for Officers manuals*, and Russian nuclear testing damage photos.)

Update (9 December 2017):

I've uploaded two 1939 Cement and Concrete Association Air Raid Shelter design booklets, relevant to civil defence, to internet archive here. The important point here is that cheap shelters were falsely "ridiculed" by Marxists like Professor Haldane and Professor Cyril Joad in Britain prior to WWII. The same nonsense is endlessly repeated by all sorts of people with an authoritarian mindset bordering on fascism or communist groupthink today, who falsely claim to be liberals (the sort of "liberals" who are bigoted, screaming, abusive, nasty patronising morons; I had a speech defect due to a hearing problem as a child and am unfortunately an expert in exposing this hypocritical nonsense as a result). Raymond Briggs, the children's cartoon illustrator, has repeatedly restated this nonsense. In *When the wind blows* - a cartoon booklet against civil defence in the Cold War which was made into an animated film that that editor of the Home Office's *Civil Protection* magazine debunked in a review headed "An Ill Wind for Civil Protection" - he claimed that simple shelters don't protect against fallout. In his more recent family history based film, he repeats the same nonsense against his family's Morrison shelter providing no shelter from glass in World War II - his parents had incorrectly sited it near a glass window without any protection from flying glass (all the WWII booklets tell you to block the windows of a room used for shelter, to stop flying glass).

The reality is this: false attacks on cheap effective civil defence were made by Lord Noel Baker from his 1926 BBC speech on gas war onward and by the so-called "Cambridge Scientists Anti-War group" (not a Cambridge University affiliation) from 1935 onwards, which gained attention because the facts were kept secret. For example, gas masks were deemed useless because mustard gas spray droplets affects the skin, while sheltering indoors against mustard gas was deemed useless because gases eventually diffuse into buildings through cracks and door seals. The reality in this example, and it applies also to nerve gas/liquid today, is that the combination of being indoors and having a gas mask provides protection against both skin contamination and inhalation risks. However, when you read "criticisms" of civil defence today, the "reductionist problem" (of breaking the argument up into skin and lung risks, and showing that gas masks don't protect the skin, etc.) remains strongly believed by anti-civil defence bigots. Another example of sophistry is the bigoted comparison of shelter costs with the costs of building hospitals, instead of comparing shelter costs with the costs of fighting wars.

THE "PAUCITY OF ALTERNATIVES"-FASCIST AGENDA OF BIGOTRY AND HATRED TOWARDS THE FACTS

Let's get this straight: in 1948 the Labour Prime Minister of Britain, Attlee, instituted both work on nuclear deterrence (building nuclear weapons) and re-started the Civil Defence Corps, in response to the threat of a Russian nuclear and conventional war capability (Russia didn't test its bomb until 1949, but the scope of its fellow-traveller nuclear research spying had become clear with case of nuclear spy Dr Alan Nunn May in 1946). In 2002, the Labour Prime Minister Tony Blair launched a war against Iraq in response to a possible "45 minute" missile launch chemical/nuclear threat. The point, for those who need it spelled out in the most lucid way possible (I guess that's almost the entire membership of CND and the pseudo Democratic Party in the USA) is this: by attacking both credible (tactical not strategic) nuclear deterrence (that worked against the USSR in the 60s under Kennedy and in the 80s under Reagan) and also civil defence using false arguments, these pseudo "peace agendas," just like those of Lord Noel Baker and the "Cambridge Scientists Anti-War group" in the 1920s-1930s caused a costly war. The costs involved, in lives and money, in using conventional weapons for regime change proved way higher than credible nuclear deterrence and civil defence.

There seems to be no way to debunk the liars. Let's again state the facts: stockpiles of weapons before WWI and WWII were insignificant compared to the vast amounts of weapons used in the wars, which as we've shown (in previous posts, see links below this blog post) were equivalent to nuclear wars. The reality is that nuclear weapons are easier and cheaper to deliver than the equivalent in conventional weapons, which means less crisis instability than the huge conventional weapons mobilizations needed in 1914 which induced tensions and excuses for aggression! In addition, the effects of nuclear weapons are more effective against aggressive forces on the move, such as the troops invading Belgium in 1914 or the tanks invading Poland in 1939 (not dug in defensively, or in modern concrete buildings like those that survived near ground zero in Hiroshima, where people are relatively well protected). This means that nuclear weapons can and do deter the invasions that trigger off large wars, but this means public education to debunk the fascist liars.

Updates, 10-15 December 2017:

A new compendium of key extracts of British civil defence publications giving the scientific basis for low cost countermeasures to make deterrence credible is linked here on internet archive (removing irrelevant administrative and bureaucratic material, and including only the key facts that debunk liars "nuclear weapons don't work to end war"-style propaganda). For comparison, an English translation of DTIC's pdf of AD773427, the 1973 Russian Civil Defence manual, is available for online browsing on internet archive at the link here. Again, we see that cheap, simple countermeasures are effective for civilians, but ineffective for invading forces on the move: nuclear weapons can credibly deter the invasions that set off terrible wars, without the collateral damage to civilians that you get with conventional weapons that failed to deter two world wars and many other conventional wars!

Furthermore, nuclear arms races have provably allowed negotiations from a position of strength (not weakness) for peace with freedom and security, as Maggie Thatcher explained in Parliament on TV on 22 November 1990. A tactically armed, credible nuclear deterrence based world is a world of peace and security, a world in which you can't launch military conquests on a whim without being easily stopped in your tracks. That's real peace!

Here's the transcript. UK Prime Minister, 22 November 1990, in House of Commons (source Hansard House of Commons 181/445-53):

"Ten years ago, the eastern part of Europe lay under totalitarian rule, its people knowing neither rights nor liberties. Today, we have a Europe in which democracy, the rule of law and basic human rights are spreading ever more widely, where the threat to our security from the overwhelming conventional forces of the Warsaw pact has been removed: where the Berlin wall has been torn down and the cold war is at an end.

"These immense changes did not come about by chance. They have been achieved by strength and resolution in defence, and by a refusal ever to be intimidated. No one in eastern Europe believes that their countries would be free had it not been for those western Governments who were prepared to defend liberty, and who kept alive their hope that one day east Europe too would enjoy freedom.

"But it was no thanks to the Labour party, or to the Campaign for Nuclear Disarmament of which the right hon. Gentleman is still a member. It is this Government who kept the nuclear weapons which ensured that we could never be blackmailed or threatened. When Brezhnev deployed the SS20s, Britain deployed the cruise missiles and was the first to do so. And all these things were done in the teeth of the opposition of the hon. Gentlemen opposite—and their ladies. [Laughter] The SS20s could never have been negotiated away without the bargaining strength which cruise and Pershing gave to the west.

"Should we be censured for our strength? Or should the Labour party be censured for its weakness? ... socialists who put expediency before principle."

(Text [here](#).) Video of [this speech](#) is available. Thatcher also gave a fine contribution to the final episode of the 1989 pro-USSR biased 12 hour documentary "The Nuclear Age", explaining clearly that conventional weapons failed to deter two world wars, this being the basic rationale for nuclear deterrence. The documentary ignored the opportunity to follow up on this piece of important wisdom, and then gave a long and boring repetition of all the nasty, vile, USSR foreign affairs department backed false propaganda claims that nuclear weapons don't deter wars/kill civilians not aggressive plans, etc.

*The fundamental reason for nuclear weapons is political: we have nuclear weapons to defend our political system from enemy takeover (empire builders). This is a key point to make, because the key effects are also political: deterrence of war, not blasts or radiation, is the key effect of nuclear weapons.*



The approach of fascism that "defeats" this is the pseudo liberal agenda of *mokusatsu*, a Japanese word meaning to "kill with silence" or to "ignore". Moku = silence; satsu = kill. Mokusatsu was the word Japanese Premier Suzuki used to the press on 28 July 1945, to express his Cabinet's response at that time to the 26 July 1945 Potsdam Declaration, which demanded unconditional surrender of Japan's armed forces (not of its government). This word was transmitted by Tokyo radio and led President Truman to authorise the nuclear bombing of Hiroshima and Nagasaki.

There is an interesting claim that the word "mokusatsu" had been used ambiguously or mistakenly by Premier Suzuki, to the fury of his Cabinet who had merely wanted a silence on the Potsdam Declaration until they had finished deciding how to respond. In any case, the point is that the word was taken to signify a fascist response, akin to the silence that Hitler gave to Britain's 1 September 1939 ultimatum for Germany to withdraw its troops from Poland to avoid a war.

Dictators have opted for silence when a reasonable discussion is needed. CND has ignored this blog exposing its errors since 2006 when it started, and other in publishing ignored an earlier book exposing the falsehoods, written in August 1990. To kill with silence is the fascist tactic used by all the deluded pseudo liberals. Another example is Hitler's last minute cancellation of booked pre-war meeting with Churchill, after he heard that Churchill supported the Jewish minority. A good way, in my humble opinion, to assess the reasonableness of people is to see if they are prepared to tolerate meaningful dissent - not screaming bleating liars - but real arguments, based on facts not falsehoods.

**Update: 17 December 2017**

Oh, and by the way, it is Roosevelt the Democrat who launched the Manhattan Project to nuke people, and it was Truman the Democrat who ordered the bombing of Hiroshima and Nagasaki with nuclear weapons in 1945, and it was Johnson the Democrat who ordered the carpet bombing in Vietnam twenty years later. Just in case there are any fascist pseudo Democrats who forget the facts.

posted by Nuclear Weapons Effects 11:46 pm  

16 COMMENTS:

At 9:09 am,  Anonymous said...

"...When a fire in the [TNT] melt pot room..." For a long time I have known that many types of ordnance were made with the filling in a molten form that solidified as it cooled. I always wondered if melting such materials caused accidental ignitions sometimes. It appears that it did. A good reason to build these facilities far away from cities and other industries

I thought the amount of damage and injuries/deaths this accident caused sounded extreme for only .1 kt. After all, the lethal radius for such a burst should be under 40 meters based on Hiroshima concrete building data. Even exposure in the open, or in wood buildings should not leave this much devastation. I did a little research on this incident, the properties of TNT, and a few other things. When tnt goes off, it puts out 4 or 5 kJ/gm. The gases produced are in and of themselves flammable, however. As they react with the air, they can release up to 10 kJ/gm, in the form of heat. This means that a very big fireball can theoretically form following the initial burst. Because this fireball is somewhat cooler than the smaller equivalent nuclear fireball, it doesn't emit thermal radiation as efficiently. At 3000 kelvin, or instance, an object with an emissivity of one will radiate just under 110cal/cm<sup>2</sup>-sec. At 4500 kelvin, this has risen to 555cal/cm<sup>2</sup>-sec. For any given flow rate, target shape, target temp, etc, the hotter blast delivers only 50% more convective heating (objects near a fire get mostly radiative heat, but objects in it get both radiative and convective). Thus, a target say, 100 meters from a .1 kt nuclear burst will get more thermal radiation than a target the same distance from 50 tons of real tnt. Most of the extra heat that tnt produces is radiated after the giant fireball rises well away from the ground, or else is convectively transferred to objects within that fireball. However, the initial fireball radius on the ground is probably much, much larger for tnt than for nuclear. As was proven at Teapot Apple-2, flammable vapors and liquids are highly resistant to thermal radiation, if only because the ignitable gas phase doesn't absorb the rays, and thus is not heated. These materials are normally very flammable, but they need flames to directly contact them, to get some heat into the flammable gas phase. At silvertown, a tank holding 200,000 cubic meters of uel gas was ruptured and ignited. If it was coal gas, 10 MJ/m<sup>3</sup>, this is 2x10<sup>12</sup> J, or about .47 kt, of heat. If the tank held natural gas, 39 MJ/m<sup>3</sup>, the energy added by this secondary fire alone was 7.8x10<sup>12</sup> J, or about 1.9 kt. A lubricant factory also caught fire. For a nuclear fireball of .1kt, these kind of effects, the ignition of gas and liquids, would only occur within at most 30 m of ground zero for a surface burst, and probably not at all for an airburst above 30 m. My theory is that the big tnt fireball started these fires by direct impingement, but that an equivalent nuclear burst would not have. Houses and industrial equipment have been designed with better fire defense since wwi, reducing the risk of ignition either by the fireball or by blast damage to gas lines fireplaces and electric equipment. Modern buildings also absorb blast before it can spread to far from GZ. They also protect their occupants better. All in all, even a 50 kT blast in modern London would likely kill less than 73 people, and destroy less than 900 houses. It's still interesting that Glasstone was a chemist at the Silvertown plant. He was lucky not to be at that particular plant during the accident! Sorry if my spelling is bad. I'm using a tablet touch screen. Violette Collingwood's face is pretty, but her hair kinda looks like a mushroom cloud!

At 11:35 am,  nige said...

"Modern buildings also absorb blast before it can spread to far from GZ. They also protect their occupants better. All in all, even a 50 kT blast in modern London would likely kill less than 73 people, and destroy less than 900 houses."

I'm all for debunking massive exaggerations of nuclear weapons effects, but I'd like to see calculations or extrapolations from data made on rational grounds, for claims about specific casualty numbers. For example, the ratio of areas in Hiroshima for 50% killed in modern concrete city buildings and for people outdoors (or standing behind windows in obsolete city centre inflammable wooden houses full of bamboo and paper screens) was found to be about 120, as Glasstone and Dolan record in their final chapter on biological effects:

50% killed to 0.12 mile radius in the lower floors of concrete buildings or similarly protective WWII air raid shelters, compared to a radius of 1.3 miles for people without any protection; the figure preferred by CND and other propaganda organizations of the sort which in the 1930s exaggerated aerial bombing to encourage appeasement policies, leading to world war and millions dead. The ratio of areas shows a protective factor (defined here as the reduction in casualties possible by modern city buildings or WWII type air raid shelters of (1.3/0.12)<sup>2</sup> = 117.

That means that the simplistic CND and related casualty rates calculated by assuming people are exposed outdoors to the thermal pulse, nuclear radiation and blast (or standing behind windows in homes without duck and cover) may be over 100 times higher than the reality for simple, well established, second world war civil defense (USA) or civil defence (UK).

100,000 casualties would be reduced to under 1,000 casualties. That's a worthwhile result, and greatly affects the "collateral damage" issue which influences the credibility of nuclear weapons for deterrence of invasions (Belgium in 1914, Poland in 1939) and military surprise attacks (Russia 1941, Pearl Harbor 1941).

However, I disagree with your extremely low figure: even with good shelters against heat and blast, in a surface burst the cratering effects and close-in very high neutron radiation doses on a civilian target will probably produce hundreds or thousands of casualties, depending on the time of day. Obviously a night time attack on the city of London will encounter a much lower population density - just a handful of night workers, cleaners, etc. - than a daytime attack when offices are full staffed. However, seeing that Russians who are friends of Putin have bought up a lot of expensive property in London, it's more sensible to focus on military attacks.

In the 1930s, the pro-fascists like the British "scientific" Socialist Eugenics fanatics (Haldane and friends) exaggerated the **scale and type of opening attack**, not just the effects of weapons (while disparaging effective shelters and gas masks that had been well and truly proved under horrific attack conditions in WWI, 1914-18, prolonging that war by preventing a simplistic "knockout blow"). The 1930s "disarmers" claimed WWII, when it came, would be open with hundreds or thousands of planes dropping explosives, incendiaries and gas bombs. In reality, it opened, like most wars, with a military invasion (Poland)!

At 10:12 pm,  Anonymous said...

"in a surface burst the cratering effects and close-in very high neutron radiation doses on a civilian target will probably produce hundreds or thousands of casualties, depending on the time of day." For a 1MT burst on soft rock, the crater radius is 58 meters. For the .05MT surface burst scenario (eg. A North Korean attack on Guam, Britain, or the US), the crater radius would be between 58x.05<sup>1/3</sup>=27 m and 58x.05<sup>1/3</sup>.3333=21 m. regardless of civil defense, a modern city is already very well protected against nuclear effects. The lethal radius is maybe 10 times smaller for any given yield than it used to be, and this means that it takes 10x10x10=1000 times as much yield to cause a given amount of damage. In the case of a missile, attack, the protection is even more, due to the amount of warning. If properly trained, people can go indoors, shut off gas and electricity (to prevent fires) and "duck and cover" away from windows. The people who survived in cement buildings near Hiroshima Ground Zero had no warning, but many still survived. With a few minutes of warning, there probably would not have been 50% mortality in any of those buildings, not even if they were right under the explosion! The only way there could be an attack without warning would be if a weapon were smuggled in. In that case, the yield would be less, leading to even less harm. Even if a 10 kt burst happened in the basement of a large skyscraper, the radius of the crater would only be 12.5 to 18 m, according to the calculation method used above. Of course, the physical mass of the device plays a role as well, and could at least theoretically increase the radius a little. Even in this extreme case of a 10kt weapon inside a large building, exploding in the middle of a workday, without warning, the casualties would probably be confined to a few floors near the burst point. Fallout or fire might escape around those floors, but the effects would generally be localized.

At 10:52 pm,  nige said...

Thanks, but while I obviously share your appreciation of the CND type gross exaggeration of nuclear weapons effects for political propaganda, including crater radii - see my posts on this blog about Glasstone and Dolan ignoring gravitational potential energy in cratering (a massive exaggeration of crater sizes especially for very high yields), I will point out that the close-in cratering effects do extend to several times the crater radius.



Missile silos are now hardened to survive in the crater region (sticking up within the crater like chimneys), but need powerful mechanisms to open the hatch despite a covering of crater throw-out. In the old days, missile silos were hardened to withstand less than 100 psi peak overpressure (690 kPa or 0.69 MPa in SI units), so would only survive outside the crater. This is similar to good underground construction, like reinforced concrete buried subway tube tunnels for underground railways (used in London during Blitz bombing in 1940). However, the ground shock near the crater would cause casualties by throwing people against the inside of the tunnels (unless they were well padded, or the people were protected with cycle type helmets, etc.). The crater ejecta, or throw-out, effect will cause damage. On the other hand, as in Hiroshima and Nagasaki, an air burst might be expected on soft civilian targets (if attacked at all) to maximise the range of damage by the Mach blast reflection effect. Surface bursts in cities would probably be restricted to suspected underground command, control and communications bunkers, if at all. After all, most dictators have had bunkers, but they are not easy to locate exactly due to secrecy (think of Hitler's Führerbunker was an air-raid shelter located near the Reich Chancellery in Berlin, which survived repeated air raids), let alone to destroy. Nuclear weapons with high x-ray yields only create very small craters in hard rock (similar to the reinforced concrete of a bunker, or for that matter, the reinforced concrete of a nuclear reactor's core containment structure).

What I think should happen is a move away, based on factual evidence, from countervalue nuclear deterrence, to tactical enhanced neutron weapons for the credible nuclear deterrence of the real sources of major wars: the invasions of countries (Belgium 1914, Poland 1939, Russian 1941). This will be possible if people know the facts so are prepared to take shelter in modern buildings or subways, to deter terrorist attacks in cities.

At 11:47 pm, Anonymous said...

I don't think we are going to have a nuclear war start at the nuclear level. More likely, it would start with a normal war. At some point, nukes would be used, and every country involved would be partially disappointed, and partially relieved when the damage turned out to be less than anticipated. The effects of tactical nuclear weapons has also been exaggerated. When large invasion forces are deployed, the men, vehicles, weaponry and supplies are dispersed over some area, and the highly limited effects of a few nuclear impacts on a few areas will not make a big difference. Even if there are a few groups of soldiers which are denser, their exact locations are often unknown. This is what was shown with conventional bombing in Vietnam. Relatively huge areas were devastated by blast, defoliants, and incendiaries, but most of these areas lacked enemy combatants. In addition, even when hit by a tactical nuclear weapon, an invasion force would likely have good protection. While tanks are notorious for catching fire in normal combat, they will only be ignited by a nuke if their hatches are open and they are within the actual fireball. The reason for this is explained in my first comment. For lower yields, tank crews would be vulnerable to initial radiation. However, this effect would have very limited range due to the effect of atmospheric shielding combined with the protection factor of the tanks. The combination of low profile, high weight, and thick armor makes tanks resistant to blast. Troops can be defended quite effectively with earthworks. As a result, none of the effects would have the ability to have an overarching impact on an invasion. The best tools to counter such a force are small arms to target individual enemies, and artillery, small rockets, remotely controlled mines, and machine guns to target groups and vehicles. An interesting side effect of the exaggerations of nuclear damage is that some people believe that nuclear weapons are pretend, a form of propaganda which is used to deter or coerce other nations in spite of not being real. These people see pictures of buildings standing in Hiroshima, people living there in perfect health, and buildings at the NTS which were scorched but not incinerated. They assume that nuclear weapons do not even exist. I think they exist, but I think they're kind overrated for any real military use. By the way, what is the peak overpressure 58 metres from a 1mt surface burst?

At 6:14 pm, nige said...

"By the way, what is the peak overpressure 58 metres from a 1mt surface burst?"

Good question, and it has no simplistic answer, because at that range the case shock (which depends on bomb design) usually predominates over air blast, and the air blast versus bomb vapour (case shock) energy partition depends on the actual mass of the bomb and the metal used for the outer casing (e.g. Mike had a steel case, whereas Bravo had aluminium). The heavier the bomb design for a given yield, the smaller the x-ray yield (and air blast) and the bigger the case shock (and close-in case shock, thus crater and silo/bunker damage).

However, the peak overpressure at 58 metres from a 1 megaton surface burst (or 5.8 m aka 19 feet from 1 kiloton, using the cube root law if it applies accurately to the case shock rather than air blast, since case shock predominates at very short ranges), is way beyond structural survival, despite its short duration (being so close-in). Many, many thousands of psi, the exact figure depending on which revision of EMI you use, or - more sensibly (less "authority", more scientific) - what the partition between air blast and case shock pressure pulse you use, which is a function of weapon design. It's not x-rays or blast compressed air that digs the crater and destroys silo/bunker reinforced concrete, it's the close-in case shock from the nuclear warhead's metal case (whatever design is used).

What I meant by surviving underground near the crater was entirely different, I meant the roughly 100 psi air blast peak overpressure near the dry earth crater radius in the Glasstone and Dolan books (1957-77, which ignore gravitational potential energy in cratering). This 100 psi has been demonstrated to be survivable by the UK Atomic Weapons Establishment in TNT tests on underground reinforced car park designs (see their paper published in 1965 book "Protective Shelters for Civilian Populations"), and the same overpressure is cited by Glasstone's 1957 edition as the the pressure that underground reinforced concrete shelters survived in nuclear tests at the Nevada test site.

At 6:15 pm, nige said...

(See the last chapter in the 1957 edition of Glasstone's "Effects of Nuclear Weapons", which was removed from subsequent editions, unhelpfully!)

At 6:16 pm, nige said...

(For the case-shock pressure versus air blast pressure energy partition equation, please see Harold Brode's article "Review of Nuclear Weapons Effects", pages 152-202 of the 1968 Annual Review of Nuclear Science, volume 18.)

At 10:44 pm, Anonymous said...

I don't doubt that an underground shelter would hold off 100 psi. If it's buried 1 m below the surface, the dirt acts as a wall 1 m thick! It may be soft, but it's also sheltered due to the fact that it doesn't stick up into the blast. Even an open ditch gives great protection, as shown in the Russian texts. There are simple, cheap face creams and fabric sheets that block the flash (see dtic ad460309, thermal protection of the individual soldier), and the aforementioned ditches also block the heat and nuclear radiation. All of these add to the ineffectiveness of nuclear warfare in both tactical and strategic uses. Maybe everyone should have thought about that, before investing in costly nuclear proliferation.

At 3:42 pm, nige said...

"All of these add to the ineffectiveness of nuclear warfare in both tactical and strategic uses. Maybe everyone should have thought about that, before investing in costly nuclear proliferation."

I agree with you regarding the use of nuclear weapons against properly defended targets, and I also agree that the exaggerations of nuclear weapons drive nuclear proliferation (e.g., Kim Jong-Un wants to deter anyone who opposes his regime from interfering with his agenda), but I think you are missing one point.

Although nuclear weapons are of limited utility against good earthwork or reinforced concrete defensive fortifications or a modern reinforced concrete city where people know that ducking and covering will stop them being blown out of buildings, unless the floors are skating rinks (dummies lying on the ground in British tests were not moved by 9psi blast), *they are of great, excellent utility in stopping an army actually on the move (tanks in the open, not dug into blast-wind-resistant shallow trenches, where they survive 30psi blast without being blown along as for the caterpillar tracked road grader photos of the 1955 Teapot-Met nuclear test in the 1957 edition of Glasstone's Effects of Nuclear Weapons [photos which were removed from all later editions!]).*

My point is that we need tactical nuclear weapons to deter offensive military invasions, tank Blitzkrieg offensives which are really behind all the world's problems

- (1) Russia's Brezhnev launched a Blitzkrieg offensive on Christmas day 1979 in Afghanistan (militarising the Taliban and giving experience of insurgency which continues to trouble the region to this day),
- (2) Hitler launched one in Western Poland on 1 September 1939, which Stalin followed 17 days later with his own invasion of Eastern Poland (as agreed in the secret annex to the August 1939 USSR-Nazi pact), resulting in WWII in the European Theatre,
- (3) Japan launched an invasion of China which eventually triggered off US sanctions on Japan and then the military surprise attack on Pearl Harbor and the Pacific Theatre of WWII,
- (4) Saddam launched a Blitzkrieg offensive of Kuwait which resulted in the first Gulf War in 1992,
- (5) Putin launched a Blitzkrieg offensive in Eastern Ukraine and Crimea in 2014, using camouflaged stealth tactics (unmarked tanks and so on, to confuse international observers and to allow propaganda media to claim that hostile acts were done by Ukrainian rebels using similar Russian made military equipment!).

If we can deter invasions (military equipment actually on the move, not dug in, or in defensive fortifications) using the threat of the neutron bomb, then all these wars can be deterred, and peace will be forthcoming.

At 3:55 am, Anonymous said...

The Russian concept for the Swan design is very interesting. It almost appears as if the depression in the side closest to the core is supposed to be close to the actual tamper. I would expect a diagram to be out of scale, with some parts placed slightly closer or further away from the end, but having the outer shell be in direct contact with the tamper seems like an intentionally included detail. Perhaps the outer shell is a lot thicker than it appears in the diagram? Really, the diagram was made based on speculation about secret hardware of another nation, so any (or every) part of it could be wrong. One strange thing about this design is that it theoretically could be designed to work without any electronic parts. During the Manhattan project it was suggested that a normal implosion device could work with primer cord, but this idea was discarded due to problems with timing ([https://en.wikipedia.org/wiki/Fat\\_Man](https://en.wikipedia.org/wiki/Fat_Man)). I would assume that these would be caused by varying amounts of air void in the cord. By incorporating the timing into the actual implosion charge, this hypothetical Russian concept would make one point implosion a lot more precise. This entire concept- an explosive lens which essentially turns part of a shock front around by 180 degrees and makes a converging spherical front-is genius if it works.

At 9:17 pm, nige said...

Thanks for your comment. Yes, the timing inconsistency problem is proportional to the length of the detonation cord or timer cord as you put it. Primacord containing PETN burns (or rather explodes) at about 6400 m/s, so if you use it for a 32 point implosion weapon like "Fat Man", you have 32 lengths of primacord, each say a metre long, and joined at the ignition point. Each of the 32 pieces of 1 m long cord then burns for 156 microseconds before reaching its anchor point on an outer lens of high explosive on the implosion system. An error of 1% in the burning time will therefore cause a error of over 1.5 microseconds in the supposedly simultaneous start of the implosion system. That could cause a non-uniform core compression with a detrimental effect on yield.

I am interested in one and two point implosion systems. I don't know if you are aware that the USA has actually published the design drawings, practically blueprints (not a sketch or a cartoon) of a proof tested two-point implosion system invented, unclassified US patent number 5450794, filed on 29 November 1963 and granted on 19 September 1995:

<http://pdfplw.uspto.gov/plw?PageNum=0&docid=05450794>

This contains a diagram for an implosion system relevant to compact nuclear shells, although the patent makes no mention of nuclear applications, but is passed off as merely a more efficient way of detonating conventional explosions!

The inventor named on the patent security cleared military physicist Bernard E. Drimmer (who worked in the Explosives Division in the U.S. Naval Ordnance Laboratory, and died on 3 December 2008), an expert with patents for shaped explosives.

The patent shows the designs of two "inert barriers", or steel discs, which are thicker in the middle (pointing towards the core) in Figure 3 (showing the linear implosion system). Linear implosion of this sort was first used successfully in the first successful Lawrence Livermore National Laboratory nuclear weapon, Teapot-Tosla (7 kilotons, detonated in Nevada on 1 March 1955) soon followed by an even smaller linear implosion weapon, Teapot-Post (2 kilotons, detonated in Nevada on 9 April 1955).

Now what is amazing about this patent is the way it was uncovered (along with a lot of other formerly secret patents): the researcher simply looked for all patents with a decades long difference between the date the patent was filed (in this case 29 November 1963) and the date the patent was granted and published (19 September 1995). In this example, 32 years elapsed during which the patent was kept secret.

At 9:39 pm, nige said...

By the way, the person who found that US patent number 5450794 with the linear implosion design in it was controversial nuclear weapons data compiler Yogi Shan, who is two ebooks on Amazon,

"The Secret World of U.S. Nuclear Weapon "Design Data", and

"The Secret World of U.S. ICBMs, Re-entry Vehicles, and Dynamic Strategic Nuclear Forces Control".

He states that he has been researching this subject since the 1960s and that he found errors in Chuck Hansen's "Swords of Armageddon" and has dug up a large number of other patents which, with careful study, reveal a range of other former secrets concerning weapons and delivery systems. We need to start making small one or two point implosion tactical weapons to deter the invasions that trigger major, costly conventional wars.

At 7:42 pm, Anonymous said...

It's interesting to see that Russia had much of the same propaganda as the US and Britain, as shown in the poster said to show the effects of a 1 megaton blast on a city. The poster shows what appears to be total destruction to 4 km, with a peak overpressure of what appears to be .5 kg/cm<sup>2</sup>. It shows ignition of fires, and other damage, past 5.4 km. This is all very reminiscent of the scaremongering in the US, and is probably a result of propaganda of either side, or both, spreading exaggerated data to try and discourage an exchange. Obviously, that's not an effective approach, but in the day, lying to the citizens of your own country, and the government of your rival, must have seemed like a brilliant idea. All it did, really, was encourage people to proliferate more nuclear weapons, which is roughly the opposite of what was desired.

At 12:20 am, nige said...

Thanks, Irving Janis analysed the "groupthink" errors involved in this kind of problem. There is a great deal of hypocrisy over scientific ethics, with blatant lying done by people like Carl Sagan on the "nuclear winter firestorm soot" going unchallenged due to secrecy.

In a 1962 issue of the Restricted journal "Fission Fragments" (published by the UK government's Home Office), for British civil defence scientific advisers, George Stanbury - who had attended the first British nuclear test and had done the research on thermal flash shadowing by city skylines - debunked the use of Nevada desert thermal data for firestorm and thus soot induced nuclear winter myths, and bemoaned eminent "academic" scientists who put out lies on TV. That was in 1962. Note again, he wrote in a Restricted journal.

Carl Sagan is criticised in Professor Brian Martin's nuclear winter analysis papers online: Richard Feynman also criticises - without naming him directly - Sagan (a popular "astronomer friend" of his) for being deceitful to get funding by pretending to the public that there are loads of wonderful applications of abstruse science, when there might not be. Again, this is done tactfully, without naming and shaming, so has no effect whatsoever.

If you do try to get some interest in the facts and fail, then name and shame media and "academic" liars on nuclear weapons effects, instead of apologising and retracting their lies, they merely take it personally as a way to ignore you again, and go on peddling myths. There's no way around it. Whatever is done, gets ignored. Exaggerations of weapons effects prior to WWI by "pacifists" encouraged enemies to attempt knockout blows! Lying backfired! Again, they did it in the 30s, resulting in appeasement and WWII!

At 12:26 am, nige said...

I do believe that it's fascist to peddle myths that undermine credible deterrence and cause wars or "peaceful" genocide.

It's got to stop. The popular myth that effective civil defense is more expensive than ineffectual regime change attempts that cost many times more money and mortality, needs to be discredited now.

It's an irrational cult, a modern day version of medieval witchcraft delusion! People need to know the facts, and put pressure on liars to stop their deceitful money-making anti-deterrence, anti-civil defense campaigns!

Post a Comment

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Credible nuclear deterrence of invasions and conventional wars reduce the risk of large conventional and nuclear wars occurring through escalation of invasions such as the invasion of Belgium in 1914 and the invasion of Poland in 1939, or of surprise attacks like those against France in 1940 and of Russia and Pearl Harbor in 1941. Contrary to irrational, pseudo-scientific propaganda, the number of nuclear weapons is smaller than the millions of conventional weapons used in large wars and the correct scaling shows that the overall effects are similar, not massively different as often claimed for political propaganda by enemies of peace. Furthermore, the greater time delay of effects from nuclear weapons over the damaged area increases the efficiency of cheap civil defence countermeasures, as compared to conventional weapons. In conclusion, credible nuclear deterrence of conventional war offers a beautiful opportunity to create a peaceful world, free from fear peddling, ranting dictators. The only oppositions you will meet will come from authoritarian obsessed fear peddling myth makers. If they can't tell the truth and face the facts, why listen to them? Please see our post on the need to *deter not only direct threats from nuclear attacks but also conventional wars and invasions* that can *escalate into nuclear wars* (as proved by the use of nuclear weapons in WWII, for example, after they were developed during the war itself and did not trigger or provoke the war), linked [here](#), [here](#), [here](#), and [here](#), [here](#), [here](#), and the true scaling law equivalence between a few thousand nuclear weapons and the several million tons of small conventional weapons in a non-nuclear world war as proved by our post [summarising key points in Herman Kahn's much-abused call for credible deterrence, On Thermonuclear War](#), linked [here](#). Peace comes through tested, proved and practical declassified countermeasures against the effects of nuclear weapons, chemical weapons and conventional weapons. Credible deterrence to end invasions and wars comes through simple, effective protection against invasions like low yield tactical weapons and walls, and civil defence against collateral damage. Peace comes through discussions of the facts as opposed to inaccurate, misleading lies of the "disarm or be annihilated" political dogma variety, which are designed to exploit fear to close down criticisms of errors in mainstream orthodoxy. In particular, please

see the post linked here on EMP results from an actual Russian 300 kt test at 290 km altitude over unwarned civilian infrastructure in Kazakhstan on 22 October 1962, which caused no injuries or deaths whatsoever (contrary to all of Jeremy Corbyn and CND style lying propaganda that any use of nuclear weapons on civilians would automatically kill millions), but shut down the communications and power supply lines! This is not secret, but does not make newspaper headlines to debunk CND style dogmas on the alleged incredibility of nuclear deterrence.

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Hiroshima's air raid shelters were unoccupied because Japanese Army officers were having breakfast when B29s were detected far away, says Yoshie Oka, the operator of the Hiroshima air raid sirens on 6 August 1945...

•

In a sample of 1,881 burns cases in Hiroshima, only 17 (or 0.9 percent) were due to ignited clothing and 15 (or 0.7%) were due to the firestorm flames...

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Dr Harold L. Brode's new book, Nuclear Weapons in ...

•

800 war migrants drowned on 22 April by EU policy:...

•

Photographed fireball shielding by cloud cover in ...

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Nuclear weapons effects "firestorm" and "nuclear w...

•

Proved 97.5% survival in completely demolished houses ...

How to achieve peace through tested, proved and practical declassified countermeasures against the effects of nuclear weapons, chemical weapons and conventional weapons. Credible deterrence through simple, effective protection against invasions and collateral damage. Discussions of the facts as opposed to inaccurate, misleading lies of the "disarm or be annihilated" political dogma variety. Hiroshima and Nagasaki anti-nuclear propaganda debunked by the hard facts. Walls not wars. Walls bring people together by stopping attacks by "divide and rule" style divisive terrorists, contrary to simplistic Vatican propaganda.

"There has never been a war yet which, if the facts had been put calmly before the ordinary folk, could not have been prevented." - British Foreign Secretary Ernest Bevin, House of Commons Debate on Foreign Affairs, Hansard, 23 November 1945, column 786 (unfortunately secret Cabinet committees called "democracy" for propaganda purposes have not been quite so successful in preventing war). Protection is needed against collateral civilian damage and contamination in conventional, chemical and nuclear attack, with credible low yield clean nuclear deterrence against conventional warfare which, in reality (not science fiction) costs far more lives. Anti scientific media, who promulgate and exploit terrorism for profit, censor (1) vital, effective civil defense knowledge and (2) effective, safe, low yield air burst clean weapons like the Mk54 and W79 which deter conventional warfare and escalation, allowing arms negotiations from a position of strength. This helped end the Cold War in the 1980s. Opposing civil defense and nuclear weapons that really deter conventional war, is complacent and dangerous.

War and coercion dangers have not stemmed from those who openly attack mainstream mistakes, but from those who camouflage themselves as freedom fighters to ban such free criticism itself, by making the key facts seem taboo, without even a proper debate, let alone financing research into unfashionable alternatives. Research and education in non-mainstream alternatives is needed before an unprejudiced debate, to establish all the basic facts for a real debate. "Wisdom itself cannot flourish, nor even truth be determined, without the give and take of debate and criticism." – Robert Oppenheimer (quotation from the H-bomb TV debate hosted by Eleanor Roosevelt, 12 February 1950).

"Apologies for freedom? I can't handle this! ... Deal from strength or get crushed every time ... Freedom demands liberty everywhere. I'm thinking, you see, it's not so easy. But we have to stand up tall and answer freedom's call!" – Freedom Kids

CONVENTIONAL WARS HAVE KILLED TENS OF MILLIONS OF PEOPLE, NUCLEAR WEAPONS CAN RAPIDLY DETER THIS REAL THREAT TO PEACE WITH MINIMAL CASUALTIES. 'During the critical period 8-15 February [1968], the U.S. command realized [that conventional] bombing was not sufficiently effective. ... The air campaign dropped over 110,000 tons of bombs and napalm on the area around Khe Sanh during the 77-day siege ... the most heavily bombed target in the history of conventional warfare.' – W. C. Yengst, S. J. Lukasik, and M. A. Jensen, *Nuclear Weapons that went to War*, SAID report DSWA-TR-97-25, September 1998 (quoted in the 2015 book by the secret *Capabilities of Nuclear Weapons* editor, Dr Harold L. Brode, *Nuclear Weapons in the Cold War*, page 287). [British Nuclear Test Civil Defence Research](#)



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Ref.: Prem 11/563 C503799

SECRET

DR. FEYNMAN'S DRAFT BROADCAST

Recorded: 30 October 1952

13

When the planning began, a lot of thought was given to deciding which type of explosion would provide information and experience of the greatest value. Purely scientific measurements are most easily made when the weapon is placed at the top of a high tower, but there were other weighty considerations. The Civil Defence authorities in this country badly needed more data about atomic explosions and, accordingly, the test was planned to get as much novel information as possible for Civil Defence. The decision was made to explode the weapon in a ship moored near land, thus simulating an explosion in a

CHANGE 1

Field Manual No 101-31-1

NUCLEAR WEAPONS EMPLOYMENT  
DOCTRINE AND PROCEDURES

Radius of vulnerability (emergency risk criterion: 5% combat ineffectiveness)

Figure 54. Radii of Vulnerability.

CATEGORY PERSONNEL (LL) IN—  
(Based on Governing Effect)

Radii listed are distances at which a 5 percent incidence of effect occurs.  
HOB used is 60W<sup>1/3</sup> meters.

Yield (KT)	Open	Open Foxholes	APCs	Tanks	Earth Shelter
(Distances are in meters)					
0.1	700	600	600	500	300
1	1200	900	900	800	500
10	3200	1300	1300	1250	900
20	4000	1500	1450	1400	1000
100	8000	1900	1800	1800	1400
200	12000	2000	1900	1900	1500
300	14000	2100	1950	1950	1600

Protective factor = ratio of  
area of effect in the open, to  
area of effect for shelter

Example: for 300 kt, the protective  
factor of open foxholes is equal to  
 $(14,000)^2 / (2,100)^2 = 44$ .

Open	Open Foxholes	APCs	Tanks	Earth Shelter	Yield (KT)
1	1.36	1.36	1.96	5.44	0.1
1	1.78	1.78	2.25	5.76	1
1	6.06	6.06	6.55	12.6	10
1	7.11	7.61	8.16	16.0	20
1	17.7	19.8	19.8	32.7	100
1	36.0	39.9	39.9	64.0	200
1	44.4	51.5	51.5	76.6	300

Calculation of the injury-averting protective factors by simple open foxholes and earth shelters, as a function of weapon yield. Most countermeasures are relatively ineffective against tactical nuclear weapons (due to the predominating neutron radiation effect at 0.1 kt yield), but are extremely effective against strategic nuclear weapons with yields of 100, 200 and 300 kt (protective factors of 44 to 77).

The definition of protective factor used here is the factor by which casualties numbers are reduced.

Richard P. Feynman, 'This Unscientific Age', in *The Meaning of It All*, Penguin Books, London, 1998, pages 106-9:

'Now, I say if a man is absolutely honest and wants to protect the populace from the effects of radioactivity, which is what our scientific friends often say they are trying to do, then he should work on the biggest number, not on the smallest number, and he should try to point out that the [natural cosmic] radioactivity which is absorbed by living in the city of Denver is so much more serious [than the smaller doses from nuclear explosions] ... that all the people of Denver ought to move to lower altitudes.'

*"If a man reads or hears a criticism of anything in which he has an interest, watch ... if he shows concern with any question except 'is it true?' he thereby reveals that his own attitude is unscientific. Likewise if ... he judges an idea not on its merits but with reference to the author of it; if he criticizes it as 'heresy'; if he argues that authority must be right because it is authority ... The path of truth is paved with critical doubt, and lighted by the spirit of objective enquiry... the majority of people have resented what seems in retrospect to have been purely matter of fact ... nothing has aided the persistence of falsehood, and the evils resulting from it, more than the unwillingness of good people to admit the truth ... the tendency continues to be shocked by natural comment, and to hold certain things too 'sacred' to think about. ... How rarely does one meet anyone whose first reaction to anything is to ask: 'is it true?' Yet, unless that is a man's natural reaction, it shows that truth is not uppermost in his mind, and unless it is, true progress is unlikely."*

- Sir Basil Henry Liddell Hart, *Why Don't We Learn from History?*, PEN Books, 1944; revised edition, Allen and Unwin, 1972.

Civil defense countermeasures, to be taken seriously by the population, require the publication of solid facts with the scientific evidence to support those facts against political propaganda to the contrary. Secrecy over the effects of nuclear weapons tests does not hinder plutonium and missile production by rogue states, but it does hinder civil defense countermeasures, by permitting lying political propaganda to go unopposed (see linked post, here).

Terrorists successfully prey on the vulnerable. The political spreading of lies concerning threats and the alleged 'impossibility' of all countermeasures, terrorizing the population in order to 'justify' supposedly pro-peace disarmament policies in the 1920s-1930s, resulted in the secret rearmament of fascist states which were terrorizing the Jews and others, eventually leading to World War II.

Political exaggerations about nuclear weapons effects today:

(1) encourage terrorist states and other groups to secretly invest in such weapons to use either for political intimidation or for future use against countries which have no countermeasures, and

(2) falsely dismiss, in the eyes of the media and the public, cheap relatively effective countermeasures like civil defense and ABM.

Therefore, doom-mongering media lies make us vulnerable to the proliferation threat today in two ways, just as they led to both world wars:

(1) Exaggerations of offensive technology and a down-playing of simple countermeasures such as trenches, encouraged belligerent states to start World War I in the false belief that modern technology implied overwhelming firepower which would terminate the war quickly on the basis of offensive preparedness: if the facts about simple trench countermeasures against shelling and machine guns during the American Civil War had been properly understood, it would have been recognised by Germany that a long war based on munitions production and logistics would be necessary, and war would have been seen to be likely to lead to German defeat against countries with larger overseas allies and colonies that could supply munitions and the other resources required to win a long war.

(2) Exaggerations of aerial bombardment technology after World War I led to disarmament 'supported by' false claims that it was impossible to have any defense against a perceived threat of instant annihilation from thousands of aircraft carrying gas and incendiary bombs, encouraging fascists to secretly rearm in order to successfully take advantage of the fear and vulnerability caused by this lying political disarmament propaganda.

Contrived dismissal of civil defense by Marxist "Cambridge Scientists Anti-War Group" bigots: (a) appeased war-mongering enemies, and (b) maximised war mortality rates. Idealism kills. Super effective, fully proof-tested, cheap civil defense makes nuclear deterrence credible to stop conventional war devastation by avoiding collateral damage, tit-for-tat retaliation and escalation.

Historically, it has been proved that having weapons is not enough to guarantee a reasonable measure of safety from terrorism and rogue states; countermeasures are also needed, both to make any deterrent credible and to negate or at least mitigate the effects of the terrorist attack. Some people who wear seatbelts die in car crashes; some people who are taken to hospital in ambulances, even in peace-time, die. Sometimes, lifebelts and lifeboats cannot save lives at sea. This lack of a 100% success rate in saving lives doesn't disprove the value of everyday precautions or of hospitals and medicine. Hospitals don't lull motorists into a false sense of security, causing them to drive faster and cause more accidents. Like-minded 'arguments' against ABM and civil defense are similarly vacuous.

'As long as the threat from Iran persists, we will go forward with a missile system that is cost-effective and proven. If the Iranian threat is eliminated, we will have a stronger basis for security, and the driving force for missile-defense construction in Europe will be removed.'

- President Obama, Prague Castle, Czech Republic, 4 April 2009.

Before 9/11, Caspar Weinberger was quizzed by skeptical critics on the BBC News program *Talking Point*, Friday, May 4, 2001: *Caspar Weinberger quizzed on new US Star Wars ABM plans:*

'The [ABM] treaty was in 1972 ... The theory ... supporting the ABM treaty [which prohibits ABM, thus making nations vulnerable to terrorism] ... that it will prevent an arms race ... is perfect nonsense because we have had an arms race all the time we have had the ABM treaty, and we have seen the greatest increase in proliferation of nuclear weapons that we have ever had. ... So the ABM treaty preventing an arms race is total nonsense. ...

'You have to understand that without any defences whatever you are very vulnerable. It is like saying we don't like chemical warfare - we don't like gas attacks - so we are going to give up and promise not to have any defences ever against them and that of course would mean then we are perfectly safe. ...

'The Patriot was not a failure in the Gulf War - the Patriot was one of the things which defeated the Scud and in effect helped us win the Gulf War. One or two of the shots went astray but that is true of every weapon system that has ever been invented. ...

'The fact that a missile defence system wouldn't necessarily block a suitcase bomb is certainly not an argument for not proceeding with a missile defence when a missile that hits can wipe out hundreds of thousands of lives in a second. ...

'The curious thing about it is that missile defence is not an offensive weapon system - missile defence cannot kill anybody. Missile defence can help preserve and protect your people and our allies, and the idea that you are somehow endangering people by having a defence strikes me almost as absurd as saying you endanger people by having a gas mask in a gas attack. ...

'President Bush said that we were going ahead with the defensive system but we would make sure that nobody felt we had offensive intentions because we would accompany it by a unilateral reduction of our nuclear arsenal. It seems to me to be a rather clear statement that proceeding with the missile defence system would mean fewer arms of this kind.

'You have had your arms race all the time that the ABM treaty was in effect and now you have an enormous accumulation and increase of nuclear weapons and that was your arms race promoted by the ABM treaty. Now if you abolish the ABM treaty you are not going to get another arms race - *you have got the arms already there* - and if you accompany the missile defence construction with the unilateral reduction of our own nuclear arsenal then it seems to me you are finally getting some kind of inducement to reduce these weapons.'

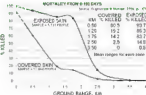
*Before the ABM system is in place, and afterwards if ABM fails to be 100% effective in an attack, or is bypassed by terrorists using a bomb in a suitcase or in a ship, civil defense is required and can be effective at saving lives:*

'Paradoxically, the more damaging the effect, that is the farther out its lethality stretches, the more can be done about it, because in the last fall of its power it covers vast areas, where small mitigations will save very large numbers of people.'

- Peter Laurie, *Beneath the City Streets: A Private Inquiry into the Nuclear Preoccupations of Government*, Penguin, 1974.

'The purpose of a book is to save people [the] time and effort of digging things out for themselves. ... we have tried to leave the reader with something tangible - what a certain number of calories, roentgens, etc., means in terms of an effect on the human being. ... we must think of the people we are writing for.'

- Dr Samuel Glasstone, DSc, letter dated 1 February 1957 to Colonel Dent L. Lay, Chief, Weapons Effects Division, U.S. Armed Forces Special Weapons Project, Washington, D.C., pages 2 and 4, concerning the preparation of *The Effects of Nuclear Weapons*.



Glasstone and Dolan stated in *The Effects of Nuclear Weapons* (1977), Table 12.17 on page 546, that the median distance in Hiroshima for survival after 20 days was 0.12 miles for people in concrete buildings and 1.3 miles for people standing outdoors. Therefore the median distances for survival in modern city buildings and in the open differed by a factor of 11 for Hiroshima; the difference in areas was thus a factor of 11<sup>2</sup> or about 120. Hence, taking cover in modern city buildings reduces the casualty rates and the risks of being killed by a factor of 120 for Hiroshima conditions, contrary to popular media presented political propaganda that civil defence is hopeless. This would reduce 120,000 casualties to 1,000 casualties.

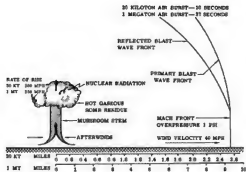
From Dr Glasstone's *Effects of Nuclear Weapons* (1962/64 ed., page 631): 'At distances between 0.3 and 0.4 mile from ground zero in Hiroshima the average survival rate, for at least 20 days after the nuclear explosion, was less than 20 percent. Yet in two reinforced concrete office buildings, at these distances, almost 90 percent of the nearly 800 occupants survived more than 20 days, although some died later of radiation injury. Furthermore, of approximately 3,000 school students who were in the open and unshielded within a mile of ground zero at Hiroshima, about 90 percent were dead or missing after the explosion. But of nearly 5,000 students in the same zone who were shielded in one way or another, only 26 percent were fatalities. ... survival in Hiroshima was possible in buildings at such distances that the overpressure in the open was 15 to 20 pounds per square inch. ... It is evident ... that the area over which protection could be effective in saving lives is roughly eight to ten times as great as that in which the chances of survival are small.'

Lord Mayhew, House of Lords debate on Civil Defence (General Local Authority Functions) Regulations, Hansard, vol. 444, cc. 523-49, 1 November 1983: '... if there had been effective civil defence at Hiroshima probably thousands of lives would have been saved and much human suffering would have been avoided. There is no question about it. ...'

Since the 1977 update by Glasstone and Dolan, extensive new updates to EM-1 for a further revised edition of *The Effects of Nuclear Weapons* have not actually been published with unlimited public distribution, due to President Carter's 1979 executive order which transferred responsibility for civil defense from the jurisdiction of the U.S. Department of Defense's Defense Civil Preparedness Agency to the new agency (which is not an Agency of the U.S. Department of Defense, and is not concerned with the analysis of nuclear weapons test effects data), the Federal Emergency Management Agency. However, the February 1997 U.S. Department of Defense's Defense Special Weapons Agency 0602715H RDT&E Budget Item Justification Sheet (R-2 Exhibit) states that a revision of Glasstone and Dolan's unclassified *Effects of Nuclear Weapons* was budgeted for 1997-9:

"FY 1997 Plans: ... Provide text to update Glasstone's book, *The Effects of Nuclear Weapons*, the standard reference for nuclear weapons effects. ... Update the unclassified textbook entitled, *The Effects of Nuclear Weapons*. ... Continue revision of Glasstone's book, *The Effects of Nuclear Weapons*, the standard reference for nuclear weapons effects. ... FY1999 Plans ... Disseminate updated *The Effects of Nuclear Weapons*."

The new publications are either classified or unclassified with limited distribution restrictions (e.g., Bridgman's *Introduction to the Physics of Nuclear Weapons Effects*, which includes several chapters on nuclear weapons design to enable initial radiation outputs to be calculated precisely) which prevents up-to-date basic nuclear effects information to justify civil defense against the latest nuclear threats from being widely disseminated; the books are printed for use only by government agencies. The problem with this approach is that widespread public understanding of the best information for civil defense countermeasures is prevented.



'The evidence from Hiroshima indicates that blast survivors, both injured and uninjured, in buildings later consumed by fire [caused by the blast overturning charcoal braziers used for breakfast in inflammable wooden houses filled with easily ignitable bamboo furnishings and paper screens] were generally able to move to safe areas following the explosion. Of 130 major buildings studied by the U.S. Strategic Bombing Survey ... 107 were ultimately burned out ... Of those suffering fire, about 20 percent were burning after the first half hour. The remainder were consumed by fire spread, some as late as 15 hours after the blast. This situation is not unlike the one our computer-based fire spread model described for Detroit.'

- Defense Civil Preparedness Agency, U.S. Department of Defense, *DCA Attack Environment Manual, Chapter 3: What the Planner Needs to Know About Fire Ignition and Spread*, report CPG 2-1A3, June 1973, Panel 27.

*The Effects of the Atomic Bomb on Hiroshima, Japan*, US Strategic Bombing Survey, Pacific Theatre, report 92, volume 2 (May 1947, secret):

Volume one, page 14:

"... the city lacked buildings with fire-protective features such as automatic fire doors and automatic sprinkler systems", and pages 26-28 state the heat flash in Hiroshima was only:

"... capable of starting primary fires in exposed, easily combustible materials such as dark cloth, thin paper, or dry rotted wood exposed to direct radiation at distances usually within 4,000 feet of the point of detonation (AZ)."

Volume two examines the firestorm and the ignition of clothing by the thermal radiation flash in Hiroshima:

Page 24:

"Scores of persons throughout all sections of the city were questioned concerning the ignition of clothing by the flash from the bomb. ... Ten school boys were located during the study who had been in school yards about 6,200 feet east and 7,000 feet west,

respectively, from AZ [air zero]. These boys had flash burns on the portions of their faces which had been directly exposed to rays of the bomb. The boys' stories were consistent to the effect that their clothing, apparently of cotton materials, 'smoked,' but did not burst into flame. ... a boy's coat ... started to smoulder from heat rays at 3,800 feet from AZ." [Contrast this to the obfuscation and vagueness in Glasstone, *The Effects of Nuclear Weapons*!]

Page 88:

"Ignition of the City. ... Only directly exposed surfaces were flash burned. Measured from GZ, flash burns on wood poles were observed at 13,000 feet, granite was roughened or spalled by heat at 1,300 feet, and vitreous tiles on roofs were blistered at 4,000 feet. ... six persons who had been in reinforced-concrete buildings within 3,200 feet of air zero stated that black cotton blackout curtains were ignited by radiant heat ... dark clothing was scorched and, in some cases, reported to have burst into flame from flash heat [although as the 1946 unclassified USSBS report admits, most immediately beat the flames out with their hands without sustaining injury, because the clothing was not drenched in gasoline, unlike peacetime gasoline tanker road accident victims]

"... but a large proportion of over 1,000 persons questioned was in agreement that a great majority of the original fires was started by debris falling on kitchen charcoal fires, by industrial process fires, or by electric short circuits. Hundreds of fires were reported to have started in the centre of the city within 10 minutes after the explosion. Of the total number of buildings investigated [135 buildings are listed] 107 caught fire, and in 69 instances, the probable cause of initial ignition of the buildings or their contents was as follows: (1) 8 by direct radiated heat from the bomb (primary fire), (2) 8 by secondary sources, and (3) 53 by fire spread from exposed [wooden] buildings."

'It is true that the Soviets have tested nuclear weapons of a yield higher than that which we thought necessary, but the 100-megaton bomb of which they spoke two years ago does not and will not change the balance of strategic power. The United States has chosen, deliberately, to concentrate on more mobile and more efficient weapons, with lower but entirely sufficient yield ...' - President John F. Kennedy in his television broadcast to the American public, 26 July 1963.

'During World War II many large cities in England, Germany, and Japan were subjected to terrific attacks by high-explosive and incendiary bombs. Yet, when proper steps had been taken for the protection of the civilian population and for the restoration of services after the bombing, there was little, if any, evidence of panic. It is the purpose of this book to state the facts concerning the atomic bomb, and to make an objective, scientific analysis of these facts. It is hoped that as a result, although it may not be feasible completely to allay fear, it will at least be possible to avoid panic.'

- Dr George Gamow (the big bang cosmologist), Dr Samuel Glasstone, DSc (Executive Editor of the book), and Professor Joseph O. Hirschfelder, *The Effects of Atomic Weapons*, Chapter 1, p. 1, Paragraph 1.3, U.S. Department of Defense, September 1950.

'The consequences of a multiweapon nuclear attack would certainly be grave ... Nevertheless, recovery should be possible if plans exist and are carried out to restore social order and to mitigate the economic disruption.'

- Philip J. Dolan, editor of *Nuclear Weapons Employment* FM 101-31 (1963), *Capabilities of Nuclear Weapons* DNA-EM-1 (1972), and *The Effects of Nuclear Weapons* (1977), Stanford Research Institute, Appendix A of the U.S. National Council on Radiological protection (NCRP) symposium *The Control of Exposure to the Public of Ionising Radiation in the Event of Accident or Attack*, 1981.

'Suppose the bomb dropped on Hiroshima had been 1,000 times as powerful ... It could not have killed 1,000 times as many people, but at most the entire population of Hiroshima ... [regarding the hype about various nuclear "overkill" exaggerations] there is enough water in the oceans to drown everyone ten times.'

- Professor Brian Martin, PhD (physics), 'The global health effects of nuclear war', *Current Affairs Bulletin*, Vol. 59, No. 7, December 1982, pp. 14-26.

In 1996, half a century after the nuclear detonations, data on cancers from the Hiroshima and Nagasaki survivors was published by D. A. Pierce et al. of the Radiation Effects Research Foundation, RERF (*Radiation Research* vol. 146 pp. 1-27; *Science* vol. 272, pp. 632-3) for 86,572 survivors, of whom 60% had received bomb doses of over 5 mSv (or 500 millirem in old units) suffering 4,741 cancers of which only 420 were due to radiation, consisting of 85 leukemias and 335 solid cancers.

'Today we have a population of 2,383 [radium dial painter] cases for whom we have reliable body content measurements. ... All 64 bone sarcoma [cancer] cases occurred in the 264 cases with more than 10 Gy [1,000 rads], while no sarcomas appeared in the 2,119 radium cases with less than 10 Gy.'

- Dr Robert Rowland, Director of the Center for Human Radiobiology, *Bone Sarcoma in Humans Induced by Radium: A Threshold Response?*, Proceedings of the 27th Annual Meeting, European Society for Radiation Biology, Radioprotection colloquies, Vol. 32CI (1997), pp. 331-8.

Zbigniew Jaworowski, 'Radiation Risk and Ethics: Health Hazards, Prevention Costs, and Radiophobia', *Physics Today*, April 2000, pp. 89-90:

'... it is important to note that, given the effects of a few seconds of irradiation at Hiroshima and Nagasaki in 1945, a threshold near 200 mSv may be expected for leukemia and some solid tumors. [Sources: UNSCEAR, *Sources and Effects of Ionizing Radiation*, New York, 1994; W. F. Heidenreich, et al., *Radiat. Environ. Biophys.*, vol. 36 (1999), p. 205; and B. L. Cohen, *Radiat. Res.*, vol. 149 (1998), p. 525.] For a protracted lifetime natural exposure, a threshold may be set at a level of several thousand millisieverts for malignancies, of 10 grays for radium-226 in bones, and probably about 1.5-2.0 Gy for lung cancer after x-ray and gamma irradiation. [Sources: G. Jaikrishnan, et al., *Radiation Research*, vol. 152 (1999), p. S149 (for natural exposure); R. D. Evans, *Health Physics*, vol. 27 (1974), p. 497 (for radium-226); H. H. Rossi and M. Zaider, *Radiat. Environ. Biophys.*, vol. 36 (1997), p. 85 (for radiogenic lung cancer).] The hormetic effects, such as a decreased cancer incidence at low doses and increased longevity, may be used as a guide for estimating practical thresholds and for setting standards. ...

'Though about a hundred of the million daily spontaneous DNA damages per cell remain unrepaired or misrepaired, apoptosis, differentiation, necrosis, cell cycle regulation, intercellular interactions, and the immune system remove about 99% of the altered cells. [Source: R. D. Stewart, *Radiation Research*, vol. 152 (1999), p. 101.] ...

'[Due to the Chernobyl nuclear accident in 1986] as of 1998 (according to UNSCEAR), a total of 1,791 thyroid cancers in children had been registered. About 93% of the youngsters have a prospect of full recovery. [Source: C. R. Moir and R. L. Teland, *Seminars in Pediatric Surgery*, vol. 3 (1994), p. 182.] ... The highest average thyroid doses in children (177 mGy) were accumulated in the Gomel region of Belarus. The highest incidence of thyroid cancer (17.9 cases per 100,000 children) occurred there in 1995, which means that the rate had increased by a factor of about 25 since 1987.

'This rate increase was probably a result of improved screening [not radiation!]. Even then, the incidence rate for occult thyroid cancers was still a thousand times lower than it was for occult thyroid cancers in nonexposed populations (in the US, for example, the rate is 13,000 per 100,000 persons, and in Finland it is 35,600 per 100,000 persons). Thus, given the prospect of improved diagnostics, there is an enormous potential for detecting yet more [fictitious] "excess" thyroid cancers. In a study in the US that was performed during the period of active screening in 1974-79, it was determined that the incidence rate of malignant and other thyroid nodules was greater by 21-fold than it had been in the pre-1974 period. [Source: Z. Jaworowski, *21st Century Science and Technology*, vol. 11 (1998), issue 1, p. 14.]'

'Professor Edward Lewis used data from four independent populations exposed to radiation to demonstrate that the incidence of leukemia was linearly related to the accumulated dose of radiation. ... Outspoken scientists, including Linus Pauling, used Lewis's risk estimate to inform the public about the danger of nuclear fallout by estimating the number of leukemia deaths that would be caused by the test detonations. In May of 1957 Lewis's analysis of the radiation-induced human leukemia data was published as a lead article in *Science* magazine. In June he presented it before the Joint Committee on Atomic Energy of the US Congress.' - Abstract of thesis by Jennifer Caron, *Edward Lewis and Radioactive Fallout: the Impact of Caltech Biologists Over Nuclear Weapons Testing in the 1950s and 60s*, Caltech, January 2003.

Dr John F. Loutit of the Medical Research Council, Harwell, England, in 1962 wrote a book called *Irradiation of Mice and Men* (University of Chicago Press, Chicago and London), discrediting the pseudo-science from geneticist Edward Lewis on pages 61, and 78-79:

'... Mole [R. H. Mole, *Brit. J. Radiol.*, v32, p497, 1959] gave different groups of mice an integrated total of 1,000 r of X-rays over a period of 4 weeks. But the dose-rate - and therefore the radiation-free time between fractions - was varied from 81 r/hour intermittently to 1.3 r/hour continuously. The incidence of leukemia varied from 40 per cent (within 15 months of the start of irradiation) in the first group to 5 per cent in the last compared with 2 per cent incidence in irradiated controls. ...

'What Lewis did, and which I have not copied, was to include in his table another group - spontaneous incidence of leukemia (Brooklyn, N.Y.) - who are taken to have received only natural background radiation throughout life at the very low dose-rate of 0.1-0.2 rad per year: the best estimate is listed as  $2 \times 10^{-6}$  like the others in the table. But the value of  $2 \times 10^{-6}$  was not calculated from the data as for the other groups; it was merely adopted. By its adoption and multiplication with the average age in years of Brooklyners - 33.7 years and radiation dose per year of 0.1-0.2 rad - a mortality rate of 7 to 13 cases per million per year due to background radiation was deduced, or some 10-20 per cent of the observed rate of 65 cases per million per year. ...

'All these points are very much against the basic hypothesis of Lewis of a linear relation of dose to leukemic effect irrespective of time. Unhappily it is not possible to claim for Lewis's work as others have done, "It is now possible to calculate - within narrow limits - how many deaths from leukemia will result in any population from an increase in fall-out or other source of radiation" [Leading article in *Science*, vol. 125, p. 963, 1957]. This is just wishful journalism.

'The burning questions to me are not what are the numbers of leukemia to be expected from atom bombs or radiotherapy, but what is to be expected from natural background. ... Furthermore, to obtain estimates of these, I believe it is wrong to go to [1950s] inaccurate, dose rate effect ignoring, data from] atom bombs, where the radiations are qualitatively different [i.e., including effects from neutrons] and, more important, the dose-rate outstandingly different.'

Samuel Glasstone and Philip J. Dolan, *The Effects of Nuclear Weapons*, 3rd ed., 1977, pp. 611-3:

'From the earlier studies of radiation-induced mutations, made with fruitflies [by Nobel Laureate Hermann J. Muller and other geneticists who worked on plants, who falsely hyped their insect and plant data as valid for mammals like humans during the June 1957 U.S. Congressional Hearings on fallout effects], it appeared that the number (or frequency) of mutations in a given population ... is proportional to the total dose ... More recent experiments with mice, however, have shown that these conclusions need to be



revised, at least for mammals. [*Mammals are biologically closer to humans, in respect to DNA repair mechanisms, than short-lived insects whose life cycles are too small to have forced the evolutionary development of advanced DNA repair mechanisms, unlike mammals that need to survive for decades before reproducing.*] When exposed to X-rays or gamma rays, the mutation frequency in these animals has been found to be dependent on the exposure (or dose) rate ...

'At an exposure rate of 0.009 roentgen per minute [0.54 R/hour], the total mutation frequency in female mice is indistinguishable from the spontaneous frequency. [Emphasis added.] *There thus seems to be an exposure-rate threshold below which radiation-induced mutations are absent ...* with adult female mice ... a delay of at least seven weeks between exposure to a substantial dose of radiation, either neutrons or gamma rays, and conception causes the mutation frequency in the offspring to drop almost to zero. ... *recovery* in the female members of the population would bring about a substantial reduction in the 'load' of mutations in subsequent generations.'

George Bernard Shaw cynically explains groupthink brainwashing bias:

'We cannot help it because we are so constituted that we always believe finally what we wish to believe. The moment we want to believe something, we suddenly see all the arguments for it and become blind to the arguments against it. The moment we want to disbelieve anything we have previously believed, we suddenly discover not only that there is a mass of evidence against, but that this evidence was staring us in the face all the time.'

From the essay titled 'What is Science?' by Professor Richard P. Feynman, presented at the fifteenth annual meeting of the National Science Teachers Association, 1966 in New York City, and published in *The Physics Teacher*, vol. 7, issue 6, 1968, pp. 313-20:

'... great religions are dissipated by following form without remembering the direct content of the teaching of the great leaders. In the same way, it is possible to follow form and call it science, but that is pseudo-science. In this way, we all suffer from the kind of tyranny we have today in the many institutions that have come under the influence of pseudoscientific advisers.

'We have many studies in teaching, for example, in which people make observations, make lists, do statistics, and so on, but these do not thereby become established science, established knowledge. They are merely an imitative form of science analogous to the South Sea Islanders' airfields - radio towers, etc., made out of wood. The islanders expect a great airplane to arrive. They even build wooden airplanes of the same shape as they see in the foreigners' airfields around them, but strangely enough, their wood planes do not fly. The result of this pseudoscientific imitation is to produce experts, which many of you are. ... you teachers, who are really teaching children at the bottom of the heap, can maybe doubt the experts. As a matter of fact, I can also define science another way: Science is the belief in the ignorance of experts.'

Richard P. Feynman, 'This Unscientific Age', in *The Meaning of It All*, Penguin Books, London, 1998, pages 106-9:

'Now, I say if a man is absolutely honest and wants to protect the populace from the effects of radioactivity, which is what our scientific friends often say they are trying to do, then he should work on the biggest number, not on the smallest number, and he should try to point out that the [natural cosmic] radioactivity which is absorbed by living in the city of Denver is so much more serious [than the smaller doses from nuclear explosions] ... that all the people of Denver ought to move to lower altitudes.'

Feynman is *not* making a point about low level radiation effects, but about the politics of ignoring the massive natural background radiation dose, while provoking hysteria over much smaller measured fallout pollution radiation doses. Why is the anti-nuclear lobby so concerned about banning nuclear energy - which is not possible even in principle since most of our nuclear radiation is from the sun and from supernova debris contaminating the Earth from the explosion that created the solar system circa 4,540 million years ago - when they could cause much bigger radiation dose reductions to the population by concentrating on the bigger radiation source, natural background radiation. It is possible to shield natural background radiation by the air, e.g. by moving the population of high altitude cities to lower altitudes where there is more air between the people and outer space, or banning the use of high-altitude jet aircraft. The anti-nuclear lobby, as Feynman stated back in the 1960s, didn't crusade to reduce the bigger dose from background radiation. Instead they chose to argue against the *much smaller* doses from fallout pollution. Feynman's argument is still today falsely interpreted as a political statement, when it is actually exposing pseudo-science and countering political propaganda. It is still ignored by the media. It has been pointed out by Senator Hickenlooper on page 1060 of the May-June 1957 U.S. Congressional Hearings before the Special Subcommittee on Radiation of the Joint Committee on Atomic Energy, *The Nature of Radioactive Fallout and Its Effects on Man*:

'I presume all of us would earnestly hope that we never had to test atomic weapons ... but by the same token I presume that we want to save thousands of lives in this country every year and we could just abolish the manufacture of [road accident causing] automobiles ...'

Dihydrogen monoxide is a potentially very dangerous chemical containing hydrogen and oxygen which has caused numerous severe burns by scalding and deaths by drowning, contributes to the greenhouse effect, accelerates corrosion and rusting of many metals, and contributes to the erosion of our natural landscape: 'Dihydrogen monoxide (DHMO) is colorless, odorless, tasteless, and kills uncounted thousands of people every year. Most of these deaths are caused by accidental inhalation of DHMO, but the dangers of dihydrogen monoxide do not end there. Prolonged exposure to its solid form causes severe tissue damage. Symptoms of DHMO ingestion can include excessive sweating and urination, and possibly a bloated feeling, nausea, vomiting and body electrolyte imbalance. For those who have become dependent, DHMO withdrawal means certain death.'

From the site for the petition against dihydrogen monoxide: 'Please sign this petition and help stop This Invisible Killer. Get the government to do something now. ... Contamination Is Reaching Epidemic Proportions! Quantities of dihydrogen monoxide have been found in almost every stream, lake, and reservoir in America today. But the pollution is global, and the contaminant has even been found in Antarctic ice. DHMO has caused millions of dollars of property damage in the Midwest, and recently California.'

A recent example of the pseudoscientific radiation 'education' masquerading as science that Feynman (quoted above) objected to in the 1960s was published in 2009 in an article called 'The proportion of childhood leukaemia incidence in Great Britain that may be caused by natural background ionizing radiation' in *Leukemia*, vol. 23 (2009), pp. 770-776, which falsely asserts - in contradiction to the evidence that the no-threshold model is *contrary* to Hiroshima and Nagasaki data: 'Risk models based primarily on studies of the Japanese atomic bomb survivors imply that low-level exposure to ionizing radiation, including ubiquitous natural background radiation, also raises the risk of childhood leukaemia. Using two sets of recently published leukaemia risk models and estimates of natural background radiation red-bone-marrow doses received by children, about 20% of the cases of childhood leukaemia in Great Britain are predicted to be attributable to this source.' The authors of this pseudoscience which is the opposite of the facts are R. Wakeford (Dalton Nuclear Institute, University of Manchester, Manchester, UK), G. M. Kendall (Childhood Cancer Research Group, Oxford, UK), and M. P. Little (Department of Epidemiology and Public Health, Imperial College, London, UK). It is disgusting and sinful that the facts about childhood leukemia are being lied on so blatantly for non-scientific purposes, and it is to be hoped that these leukemia investigators will either correct their errors or alternatively be banned from using scientific literature to promote false dogma for deception until they mend the error of their ways and repent their sins in this matter.

Protein P53, discovered only in 1979, is encoded by gene TP53, which occurs on human chromosome 17. P53 also occurs in other mammals including mice, rats and dogs. P53 is one of the proteins which continually repairs breaks in DNA, which easily breaks at body temperature: the DNA in each cell of the human body suffers at least two single strand breaks every second, and one double strand (i.e. complete double helix) DNA break occurs at least once every 2 hours (5% of radiation-induced DNA breaks are double strand breaks, while 0.007% of spontaneous DNA breaks at body temperature are double strand breaks!) Cancer occurs when several breaks in DNA happen to occur by chance at nearly the same time, giving several loose strand ends at once, which repair proteins like P53 then repair incorrectly, causing a mutation which can be proliferated somatically. This cannot occur when only one break occurs, because only two loose ends are produced, and P53 will reattach them correctly. But if low-LET ionising radiation levels are increased to a certain extent, causing more single strand breaks, P53 works faster and is able deal with faster breaks as they occur, so that multiple broken strand ends do not arise. This prevents DNA strands being repaired incorrectly, and prevents cancer - a result of mutation caused by faults in DNA - from arising. Too much radiation of course overloads the P53 repair mechanism, and then it cannot repair breaks as they occur, so multiple breaks begin to appear and loose ends of DNA are wrongly connected by P53, causing an increased cancer risk.

1. DNA-damaging free radicals are equivalent to a source of sparks which is always present naturally.
2. Cancer is equivalent the fire you get if the sparks are allowed to ignite the gasoline, i.e. if the free radicals are allowed to damage DNA without the damage being repaired.
3. Protein P53 is equivalent to a fire suppression system which is constantly damping out the sparks, or repairing the damaged DNA so that cancer doesn't occur.

In this way of thinking, the 'cause' of cancer will be down to a failure of a DNA repairing enzyme like protein P53 to repair the damage.

Dr Jane Orient, 'Homeland Security for Physicians', *Journal of American Physicians and Surgeons*, vol. 11, number 3, Fall 2006, pp. 75-9:

'In the 1960s, a group of activist physicians called Physicians for Social Responsibility (PSR) undertook to "educate the medical profession and the world about the dangers of nuclear weapons," beginning with a series of articles in the *New England Journal of Medicine*. [Note that journal was publishing information for anti-civil defense propaganda back in 1949, e.g. the article in volume 241, pp. 647-53 of *New England Journal of Medicine* which falsely suggests that civil defense in nuclear war would be hopeless because a single burned patient in 1947 with 40% body area burns required 42 oxygen tanks, 36 pints of plasma, 40 pints of whole blood, 104 pints of fluids, 4,300 m of gauze, 3 nurses and 2 doctors. First, only unclothed persons in direct line of sight without shadowing can get 40% body area burns from thermal radiation, second, duck and cover offers protection in a nuclear attack warning, and G. V. LeRoy had already published, two years earlier, in J.A.M.A., volume 134, 1947, pp. 1143-8, that less than 5% of burns in Hiroshima and Nagasaki were caused by building and debris fires. In medicine it is always possible to expend vast resources on patients who are fatally injured. In a mass casualty situation, doctors should not give up just because they don't have unlimited resources; as at Hiroshima and Nagasaki, they would need to do their best with what they have.] On its website, www.psr.org, the group boasts that it "led the campaign to end atmospheric nuclear testing." With this campaign, the linear no-threshold (LNT) theory of radiation carcinogenesis became entrenched. It enabled activists to calculate enormous numbers of potential casualties by taking a tiny risk and multiplying it by the population of the earth. As an enduring consequence, the perceived risks of radiation are far out of proportion to actual risks, causing tremendous damage to the American nuclear industry. ... Efforts to save lives were not only futile, but unethical: Any suggestion that nuclear war could be survivable increased its likelihood and was thus tantamount to warmongering, PSR spokesmen warned. ...

'For the mindset that engendered and enables this situation, which jeopardizes the existence of the United States as a nation as well as the lives of millions of its citizens, some American physicians and certain prestigious medical organizations bear a heavy responsibility.

'Ethical physicians should stand ready to help patients to the best of their ability, and not advocate sacrificing them in the name of a political agenda. **Even very basic knowledge, especially combined with simple, inexpensive advance preparations, could save countless lives.'**

Dr Theodore B. Taylor, *Proceedings of the Second Interdisciplinary Conference on Selected Effects of a General War*, DASIAC Special Report 95, July 1969, vol. 2, DASA-2019-2, AD0690959, page 298 (also linked here):

'I must just say that as far as I'm concerned I have had some doubts about whether we should have had a civil defense program in the past. I have no doubt whatsoever now, for this reason, that I've seen ways in which the deterrent forces can fail to hold things off, so that no matter what our national leaders do, criminal organizations, what have you, groups of people over which we have no control whatsoever, can threaten other groups of people.'

This point of Taylor is the key fact on the morality. Suppose we disarm and abandon nuclear power. That won't stop fallout from a war, terrorists, or a foreign reactor blast from coming. Civil defence knowledge is needed. Even when America has ABM, it will be vulnerable to wind carried fallout. No quantity of pacifist hot air will protect people against radiation.

Charles J. Hitch and Roland B. McKean of the RAND Corporation in their 1960 book *The Economics of Defense in the Nuclear Age*, Harvard University Press, Massachusetts, pp. 310-57:

'With each side possessing only a small striking force, a small amount of cheating would give one side dominance over the other, and the incentive to cheat and prepare a preventative attack would be strong ... With each side possessing, say, several thousand missiles, a vast amount of cheating would be necessary to give one side the ability to wipe out the other's striking capability. ... the more extensive a disarmament agreement is, the smaller the force that a violator would have to hide in order to achieve complete domination. Most obviously, "the abolition of the weapons necessary in a general or 'unlimited' war" would offer the most insuperable obstacles to an inspection plan, since the violator could gain an overwhelming advantage from the concealment of even a few weapons.'

Disarmament after World War I caused the following problem which led to World War II (reported by Winston S. Churchill in the London Daily Express newspaper of November 1, 1934):

'Germany is arming secretly, illegally and rapidly. A reign of terror exists in Germany to keep secret the feverish and terrible preparations they are making.'

British Prime Minister Thatcher's address to the United Nations General Assembly on disarmament on 23 June 1982, where she pointed out that in the years since the nuclear attacks on Hiroshima and Nagasaki, 10 million people had been killed by 140 non-nuclear conflicts:

'The fundamental risk to peace is not the existence of weapons of particular types. It is the disposition on the part of some states to impose change on others by resorting to force against other nations ... Aggressors do not start wars because an adversary has built up his own strength. They start wars because they believe they can gain more by going to war than by remaining at peace.'

J. D. Culshaw, the then Director of the U.K. Home Office Scientific Advisory Branch, stated in his article in the Scientific Advisory Branch journal *Fission Fragments*, September 1972 (issue No. 19), classified 'Restricted':

'Apart from those who don't want to know or can't be bothered, there seem to be three major schools of thought about the nature of a possible Third World War ...

\* 'The first group think of something like World War II but a little worse ...

\* '... the second of World War II but very much worse ...

\* 'and the third group think in terms of a catastrophe ...

'When the Armageddon concept is in favour, the suggestion that such problems exist leads to "way out" research on these phenomena, and it is sufficient to mention a new catastrophic threat [e.g., 10 years later this was done by Sagan with "nuclear winter" hype, which turned out to be fake because modern concrete cities can't produce firestorms like 1940s wooden-built areas of Hamburg, Dresden and Hiroshima] to stimulate research into the possibilities of it arising. The underlying appeal of this concept is that if one could show that the execution of all out nuclear, biological or chemical warfare would precipitate the end of the world, no one but a mad man would be prepared to initiate such a war. [However, as history proves, plenty of mad men end up gaining power and leading countries into wars.]'

J. K. S. Clayton, then Director of the U.K. Home Office Scientific Advisory Branch, stated in his introduction, entitled *The Challenge - Why Home Defence?*, to the 1977 Home Office Scientific Advisory Branch *Training Manual for Scientific Advisers*:

'Since 1945 we have had nine wars - in Korea, Malaysia and Vietnam, between China and India, China and Russia, India and Pakistan and between the Arabs and Israelis on three occasions. We have had confrontations between East and West over Berlin, Formosa and Cuba. There have been civil wars or rebellions in no less than eleven countries and invasions or threatened invasions of another five. Whilst it is not suggested that all these incidents could have resulted in major wars, they do indicate the aptitude of mankind to resort to a forceful solution of its problems, sometimes with success. ...'

It is estimated that Mongol invaders exterminated 35 million Chinese between 1311-40, without modern weapons. Communist Chinese killed 26.3 million dissenters between 1949 and May 1965, according to detailed data compiled by the Russians on 7 April 1969. The Soviet communist dictatorship killed 40 million dissenters, mainly owners of small farms, between 1917-59. Conventional (non-nuclear) air raids on Japan killed 600,000 during World War II. The single incendiary air raid on Tokyo on 10 March 1945 killed 140,000 people (more than the total for nuclear bombs on Hiroshima and Nagasaki combined) at much less than the \$2 billion expense of the Hiroshima and Nagasaki nuclear bombs! Non-nuclear air raids on Germany during World War II killed 593,000 civilians. The argument that the enemy will continue stocking megaton fallout weapons if we go to cleaner weapons is irrelevant for deterrence, since we're not planning to start war, just to credibly deter invasions. You should not try to lower your standards of warfare to those of your enemy to appease groupthink taboos, or you will end up like Britain's leaders in the 1930s, trying to collaborate with fascists for popular applause.

House of Lords debate *Nuclear Weapons: Destructive Power*, published in Hansard, 14 June 1988:

Lord Hailsham of Saint Marylebone: 'My Lords, if we are going into the question of lethality of weapons and seek thereby to isolate the nuclear as distinct from the so-called conventional range, is there not a danger that the public may think that Vimy, Passchendaele and Dresden were all right—sort of tea parties—and that nuclear war is something which in itself is unacceptable?'

Lord Trefgarne: 'My Lords, the policy of making Europe, or the rest of the world, safe for conventional war is not one that I support.'

House of Commons debate *Civil Defence* published in Hansard, 26 October 1983:

Mr. Bill Walker (Tayside, North): 'I remind the House that more people died at Stalingrad than at Hiroshima or Nagasaki. Yet people talk about fighting a conventional war in Europe as if it were acceptable. One rarely sees demonstrations by the so-called peace movement against a conventional war in Europe, but it could be nothing but ghastly and horrendous. The casualties would certainly exceed those at Stalingrad, and that cannot be acceptable to anyone who wants peace'

On 29 October 1982, Thatcher stated of the Berlin Wall: 'In every decade since the war the Soviet leaders have been reminded that their pitiless ideology only survives because it is maintained by force. But the day comes when the anger and frustration of the people is so great that force cannot contain it. Then the edifice cracks: the mortar crumbles ... one day, liberty will dawn on the other side of the wall.'

On 22 November 1990, she said: 'Today, we have a Europe ... where the threat to our security from the overwhelming conventional forces of the Warsaw Pact has been removed; where the Berlin Wall has been torn down and the Cold War is at an end. These immense changes did not come about by chance. They have been achieved by strength and resolution in defence, and by a refusal ever to be intimidated.'

'The case for civil defence stands regardless of whether a nuclear deterrent is necessary or not. ... Even if the U.K. were not itself at war, we would be as powerless to prevent fallout from a nuclear explosion crossing the sea as was King Canute to stop the tide.' - U.K. Home Office leaflet, Civil Defence, 1982.

'... peace cannot be guaranteed absolutely. Nobody can be certain, no matter what policies this or any other Government were to adopt, that the United Kingdom would never again be attacked. Also we cannot tell what form such an attack might take. Current strategic thinking suggests that if war were to break out it would start with a period of conventional hostilities of uncertain duration which might or might not escalate to nuclear conflict. ... while nuclear weapons exist there must always be a chance, however small, that they will be used against us [like gas bombs in World War II]. ... as a consequence of war between other nations in which we were not involved fall out from nuclear explosions could fall on a neutral Britain. ... conventional war is not the soft option that is sometimes suggested. It is also too easily forgotten that in World War II some 50 million people died and that conventional weapons have gone on killing people ever since 1945 without respite.' - - The Minister of State, Scottish Office (Lord Gray of Contin), House of Lords debate on Civil Defence (General Local Authority Functions) Regulations, Hansard, vol. 444, cc. 523-49, 1 November 1983.

'All of us are living in the light and warmth of a huge hydrogen bomb, 860,000 miles across and 93 million miles away, which is in a state of continuous explosion.' - Dr Isaac Asimov.

'Dr Edward Teller remarked recently that the origin of the earth was somewhat like the explosion of the atomic bomb...' - Dr Harold C. Urey, *The Planets: Their Origin and Development*, Yale University Press, New Haven, 1952, p. ix.

'But compared with a supernova a hydrogen bomb is the merest trifle. For a supernova is equal in violence to about a million million million hydrogen bombs all going off at the same time.' - Sir Fred Hoyle (1915-2001), *The Nature of the Universe*, Pelican Books, London, 1963, p. 75.

'In fact, physicists find plenty of interesting and novel physics in the environment of a nuclear explosion. Some of the physical phenomena are valuable objects of research, and promise to provide further understanding of nature.' – Dr Harold L. Brode, The RAND Corporation, 'Review of Nuclear Weapons Effects,' *Annual Review of Nuclear Science*, Volume 18, 1968, pp. 153-202.

'It seems that similarities do exist between the processes of formation of single particles from nuclear explosions and formation of the solar system from the debris of a  $4 \times 10^{28}$  megatons of TNT equivalent, type Ia supernova explosion. We may be able to learn much more about the origin of the earth, by further investigating the process of radioactive fallout from the nuclear weapons tests.' – Dr Paul K. Kuroda (1917-2001), University of Arkansas, 'Radioactive Fallout in Astronomical Settings: Plutonium-244 in the Early Environment of the Solar System,' pages 83-96 of *Radionuclides in the Environment: A Symposium Sponsored by the Division of Nuclear Chemistry and Technology At the 155th Meeting of the American Chemical Society, San Francisco, California, April 1-3, 1968*, edited by Symposium Chairman Dr Edward C. Freiling (1922-2000) of the U.S. Naval Radiological Defense Laboratory, Advances in Chemistry Series No. 93, American Chemical Society, Washington, D.C., 1970.

Dr Paul K. Kuroda (1917-2001) in 1956 correctly predicted the existence of water-moderated natural nuclear reactors in flooded uranium ore seams, which were discovered in 1972 by French physicist Francis Perrin in three ore deposits at Oklo in Gabon, where sixteen sites operated as natural nuclear reactors with self-sustaining nuclear fission 2,000 million years ago, each lasting several hundred thousand years, averaging 100 kW. The radioactive waste they generated remained in situ for a period of 2,000,000,000 years without escaping. They were discovered during investigations into why the U-235 content of the uranium in the ore was only 0.7171% instead of the normal 0.7202%. Some of the ore, in the middle of the natural reactors, had a U-235 isotopic abundance of just 0.440%. Kuroda's brilliant paper is entitled, 'On the Nuclear Physical Stability of the Uranium Minerals', published in the *Journal of Chemical Physics*, vol. 25 (1956), pp. 781-782 and 1295-1296.

A type Ia supernova explosion, always yielding  $4 \times 10^{28}$  megatons of TNT equivalent, results from the critical mass effect of the collapse of a white dwarf as soon as its mass exceeds 1.4 solar masses due to matter falling in from a companion star. The degenerate electron gas in the white dwarf is then no longer able to support the pressure from the weight of gas, which collapses, thereby releasing enough gravitational potential energy as heat and pressure to cause the fusion of carbon and oxygen into heavy elements, creating massive amounts of radioactive nuclides, particularly intensely radioactive nickel-56, but half of all other nuclides (including uranium and heavier) are also produced by the 'R' (rapid) process of successive neutron captures by fusion products in supernovae explosions. Type Ia supernovae occur typically every 400 years in the Milky Way galaxy. On 4 July 1054, Chinese astronomers observed in the sky (without optical instruments) the bright supernova in the constellation Taurus which today is still visible as the Crab Nebula through telescopes. The Crab Nebula debris has a diameter now of 7 light years and is still expanding at 800 miles/second. The supernova debris shock wave triggers star formation when it encounters hydrogen gas in space by compressing it and seeding it with debris; bright stars are observed in the Orion Halo, the 300 light year diameter remains of a supernova. It is estimated that when the solar system was forming 4,540 million years ago, a supernova occurred around 100 light years away, and the heavy radioactive debris shock wave expanded at 1,000 miles/second. Most of the heavy elements including iron, silicon and calcium in the Earth and people are the stable end products of originally radioactive decay chains from the space burst fallout of a  $7 \times 10^{26}$  megatons thermonuclear explosion, created by fusion and successive neutron captures after the implosion of a white dwarf; a supernova explosion.

How would a  $10^{55}$  megaton hydrogen bomb explosion differ from the big bang? Ignorant answers biased in favour of curved spacetime (ignoring quantum gravity!) abound, such as claims that explosions can't take place in 'outer space' (disagreeing with the facts from nuclear space bursts by Russia and America in 1962, not to mention natural supernova explosions in space!) and that explosions produce sound waves in air by definition! There are indeed major differences in the nuclear reactions between the big bang and a nuclear bomb. But it is helpful to notice the solid physical fact that implosion systems suggest the mechanism of gravitation: in implosion, TNT is well-known to produce an inward force on a bomb core, but Newton's 3rd law says there is an equal and opposite reaction force outward. In fact, you can't have a radially outward force without an inward reaction force! It's the rocket principle. The rocket accelerates (with force  $F = ma$ ) forward by virtue of the recoil from accelerating the exhaust gas (with force  $F = -ma$ ) in the opposite direction! Nothing massive accelerates without an equal and opposite reaction force. Applying this fact to the measured  $6 \times 10^{-10} \text{ ms}^{-2} \sim Hc$  cosmological acceleration of matter radially outward from observers in the universe which was predicted accurately in 1996 and later observationally discovered in 1999 (by Perlmutter, et al.), we find an outward force  $F = ma$  and inward reaction force by the 3rd law. The inward force allows quantitative predictions, and is mediated by gravitons, predicting gravitation in a checkable way (unlike string theory, which is just a landscape of  $10^{500}$  different perturbative theories and so can't make any falsifiable predictions about gravity). So it seems as if nuclear explosions do indeed provide helpful analogies to natural features of the world, and the mainstream  $\Lambda$ CDM model of cosmology - with its force-fitted unobserved *ad hoc* speculative 'dark energy' - ignores and sweeps under the rug major quantum gravity effects which increase the physical understanding of particle physics, particularly force unification and the relation of gravitation to the existing electroweak SU(2) x U(1) section of the Standard Model of fundamental forces.

Richard Lieu, Physics Department, University of Alabama, 'Lambda-CDM cosmology: how much suppression of credible evidence, and does the model really lead its competitors, using all evidence?', <http://arxiv.org/abs/0705.2462>.

Even Einstein grasped the possibility that general relativity's  $\Lambda$ CDM model is at best just a classical approximation to quantum field theory, at the end of his life when he wrote to Besso in 1954:

'I consider it quite possible that physics cannot be based on the [classical differential equation] field principle, i.e., on continuous structures. In that case, nothing remains of my entire castle in the air, [non-quantum] gravitation theory included ...'

'Science is the organized skepticism in the reliability of expert opinion.' - Professor Richard P. Feynman (quoted by Professor Lee Smolin, *The Trouble with Physics*, Houghton-Mifflin, New York, 2006, p. 307).

'The expression of dissenting views may not seem like much of a threat to a powerful organization, yet sometimes it triggers an amazingly hostile response. The reason is that a single dissenter can puncture an illusion of unanimity. ... Among those suppressed have been the engineers who tried to point out problems with the Challenger space shuttle that caused it to blow up. More fundamentally, suppression is a denial of the open dialogue and debate that are the foundation of a free society. Even worse than the silencing of dissidents is the chilling effect such practices have on others. For every individual who speaks out, numerous others decide to play it safe and keep quiet. More serious than external censorship is the problem of self-censorship.'

— Professor Brian Martin, University of Wollongong, 'Stamping Out Dissent', *Newsweek*, 26 April 1993, pp. 49-50

In 1896, Sir James Mackenzie-Davidson asked Wilhelm Röntgen, who discovered X-rays in 1895: 'What did you think?' Röntgen replied: 'I did not think, I investigated.' The reason? Cathode ray expert J. J. Thomson in 1894 saw glass fluorescence far from a tube, but due to prejudice (expert opinion) he avoided investigating that X-ray evidence! 'Science is the organized skepticism in the reliability of expert opinion.' - Richard Feynman, in Lee Smolin, *The Trouble with Physics*, Houghton-Mifflin, 2006, p. 307.

Mathematical symbols in this blog: your computer's browser needs access to standard character symbol sets to display Greek symbols for mathematical physics. If you don't have the symbol character sets installed, the density symbol ' $\rho$ ' (*Rho*) will appear as 'r' and the ' $\rho$ ' (*Pi*) symbol will appear as 'p', causing confusion with the use of 'r' for radius and 'p' for momentum in formulae. This problem exists with Mozilla Firefox 3, but not with Microsoft Explorer which displays Greek symbols.

#### About Me



Name: nige

Currently designing secure active server page (ASP) front ends for client SQL databases. In 1982 I began programming in basic, and at college learned Fortran while a physics undergraduate a decade later. Afterwards, I switched from mainstream physics and mathematical education to part-time programming student, while working in a series of jobs including four years in credit control. [www.quantumfieldtheory.org](http://www.quantumfieldtheory.org) <http://glasstone.blogspot.co.uk/2015/07/capabilities-of-nuclear-weapons.html> <http://www.math.columbia.edu/~woit/wordpress/?p=273#comment-5322>. <http://www.math.columbia.edu/~woit/wordpress/?p=353&cpage=1#comment-8728>. <http://www.math.columbia.edu/~woit/wordpress/?p=215#comment-4082>.

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From 1945-62, America tested 216 nuclear weapons in the atmosphere, totalling 154 megatons, with a mean yield of 713 kilotons

From 1949-62, Russia tested 214 nuclear weapons in the atmosphere, totalling 281 megatons, with a mean yield of 1.31 megatons

From 1952-8, Britain tested 21 nuclear weapons in the atmosphere, totalling 10.8 megatons, with a mean yield of 514 kilotons

From 1960-74, France tested 46 nuclear weapons in the atmosphere, totalling 11.4 megatons, with a mean yield of 248 kilotons

From 1964-80, China tested 23 nuclear weapons in the atmosphere, totalling 21.5 megatons, with a mean yield of 935 kilotons

In summary, from 1945-80, America, Russia, Britain, France and China tested 520 nuclear weapons in the atmosphere, totalling 478.7 megatons, with a mean yield of 921 kilotons

Mean yield of the 5,192 nuclear warheads and bombs in the deployed Russian nuclear stockpile as of January 2009: 0.317 Mt. Total yield: 1,646 Mt.

Mean yield of the 4,552 nuclear warheads and bombs in the deployed U.S. nuclear stockpile as of January 2007: 0.257 Mt. Total yield: 1,172 Mt.

For diffraction damage where damage areas scale as the two-thirds power of explosive yield, this stockpile's area damage potential can be compared to the 20,000,000 conventional bombs of 100 kg size (2 megatons of TNT equivalent total energy) dropped on Germany during World War II: (Total nuclear bomb blast diffraction damaged ground area)/(Total conventional blast diffraction damaged ground area to Germany during World War II) =  $[4,552 \times (0.257 \text{ Mt})^{2/3}] / [20,000,000 \times (0.0000001 \text{ Mt})^{2/3}] = 1,840/431 = 4.3$ . Thus, although the entire U.S. stockpile has a TNT energy equivalent to 586 times that of the 2 megatons of conventional bombs dropped on Germany in World War II, it is only capable of causing 4.3 times as much diffraction type damage area, because any given amount of explosive energy is far more efficient when distributed over many small explosions than in a single large explosion! Large explosions are inefficient because they cause unintended collateral damage, wasting energy off the target area and injuring or damaging unintended targets!



In a controlled sample of 36,500 survivors, 89 people got leukemia over a 40 year period, above the number in the unexposed control group. (Data: *Radiation Research*, volume 146, 1996, pages 1-27.) Over 40 years, in 36,500 survivors monitored, there were 176 leukemia deaths which is 89 more than the control (unexposed) group got naturally. There were 4,687 other cancer deaths, but that was merely 339 above the number in the control (unexposed) group, so this is statistically a much smaller rise than the leukemia result. Natural leukemia rates, which are very low in any case, were increased by 51% in the irradiated survivors, but other cancers were merely increased by just 7%. Adding all the cancers together, the total was 4,863 cancers (virtually all natural cancer, nothing whatsoever to do with radiation), which is just 428 more than the unexposed control group. Hence, the total increase over the natural cancer rate due to bomb exposure was only 9%, spread over a period of 40 years. There was no increase whatsoever in genetic malformations.

There should be a note here about how unnatural radioactive pollution is (not) in space: the earth's atmosphere is a radiation shield equivalent to being protected behind a layer of water 10 metres thick. This reduces the cosmic background radiation by a factor of 100 of what it would be without the earth's atmosphere. Away from the largely uninhabited poles, the Earth's magnetic field also protects us against charged cosmic radiations, which are deflected and end up spiralling around the magnetic field at high altitude, in the Van Allen trapped radiation belts. *On the Moon, for example, there is no atmosphere or significant magnetic field so the natural background radiation exposure rate at solar minimum is 1 milliRoentgen per hour (about 10 microSieverts/hour) some 100 times that on the Earth (0.010 milliRoentgen per hour or about 0.10 microSieverts/hour). The Apollo astronauts visiting the Moon wore dosimeters and they received an average of 275 milliRoentgens (about 2.75 milliSieverts) of radiation (well over a year's exposure to natural background at sea level) in over just 19.5 days.* It is a lot more than that during a solar flare, which is one of the concerns for astronauts to avoid (micrometeorites are another concern in a soft spacesuit).

The higher up you are above sea level, the less of the atmosphere there is between you and space, so the less shielding you have to protect you from the intense cosmic space radiations (emitted by thermonuclear reactors we call 'stars', as well as distant supernovae explosions). At sea level, the air above you constitutes a radiation shield of 10 tons per square metre or the equivalent of having a 10 metres thick water shield between you and outer space. As you go up a mountain or up in an aircraft, the amount of atmosphere between you and space decreases, thus radiation levels increase with altitude because there is less shielding. *The normal background radiation exposure rate shoots up by a factor of 20, from 0.010 to 0.20 milliRoentgens per hour, when any airplane ascends from sea level to 36,000 feet cruising altitude.* (The now obsolete British Concorde supersonic transport used to maintain radiation-monitoring equipment so that it could drop to lower-altitude flight routes if excessive cosmic radiation due to solar storms were detected.) Flight aircrew get more radiation exposure than many nuclear industry workers at nuclear power plants. Residents of the high altitude city of Denver get 100 milliRoentgens (about 1 milliSievert) more annual exposure than a resident of Washington, D.C., but the mainstream anti-radiation cranks don't campaign for the city to be shut to save kids radiation exposure, for mountain climbing to be banned, etc!.

1994 revised Introduction to Kearny's Nuclear War Survival Skills, by Dr Edward Teller, January 14, 1994:

'If defense is neglected these weapons of attack become effective. They become available and desirable in the eyes of an imperialist dictator, even if his means are limited. Weapons of mass destruction could become equalizers between nations big and small, highly developed and primitive, if defense is neglected. If defense is developed and if it is made available for general prevention of war, weapons of aggression will become less desirable. Thus defense makes war itself less probable. ... One psychological defense mechanism against danger is to forget about it. This attitude is as common as it is disastrous. It may turn a limited danger into a fatal difficulty.'

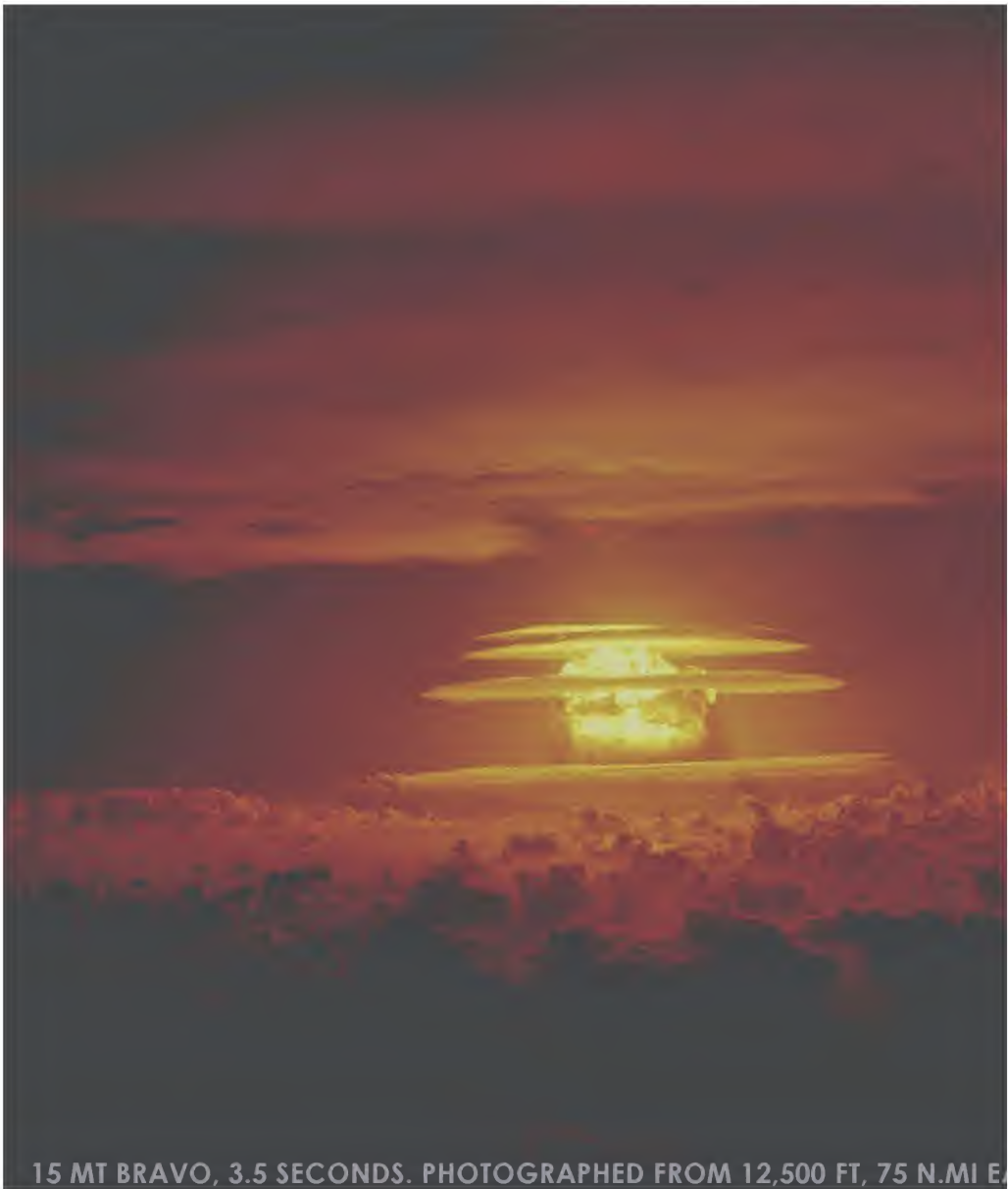
Advice of Robert Watson-Watt (Chief Scientist on the World War II British Radar Project, defending Britain against enemy attacks): 'Give them the third best to go on with, the second best comes too late, the best never comes.'

From Wikipedia (a source of groupthink): 'Groupthink is a type of thought exhibited by group members who try to minimize conflict and reach consensus without critically testing, analyzing, and evaluating ideas. Individual creativity, uniqueness, and independent thinking are lost in the pursuit of group cohesiveness, as are the advantages of reasonable balance in choice and thought that might normally be obtained by making decisions as a group. During groupthink, members of the group avoid promoting viewpoints outside the comfort zone of consensus thinking. A variety of motives for this may exist such as a desire to avoid being seen as foolish, or a desire to avoid embarrassing or angering other members of the group. Groupthink may cause groups to make hasty, irrational decisions, where individual doubts are set aside, for fear of upsetting the group's balance.'

## Links

- ◆ Google News
- ◆ Dr Carl E. Baum's EMP theory and interaction notes
- ◆ The Atomic Heritage Foundation
- ◆ Radiation Effects Research Foundation lumps data together to cover up benefits of low dose radiation in Hiroshima and Nagasaki Life Span Study!
- ◆ DTRA (Defense Threat Reduction Agency) Nuclear testing histories (PDF files)
- ◆ Samuel Glasstone and Philip J. Dolan
- ◆ Carl F. Miller's fallout research at nuclear tests
- ◆ British Home Office Scientific Advisory Branch
- ◆ Samuel Cohen's book about the collateral damage averting, invasion-detering neutron bomb he invented, and the lying political attacks he endured as a result
- ◆ Jerry Emanuelson's review of EMP facts, including the direct dependence of the EMP on the Earth's natural magnetic field strength at the burst location
- ◆ Essays by 1950s American nuclear weapon effects test (and neutron bomb design) experts, discrediting anti-civil defence propaganda
- ◆ Neutron bomb inventor Samuel Cohen's 2006 book on the history of the neutron bomb, the most moral weapon ever invented due to its purely military deterrent capabilities, and the pseudo-scientific propaganda war he has had to endure from the enemies of deterrence
- ◆ Karl-Ludvig Grønhaug's EMP reports page with useful PDF downloads on prompt EMP and MHD-EMP measurements from nuclear tests (Norwegian language)
- ◆ Colonel Derek L. Duke's factual book on nuclear weapons accidents, *Chasing Loose Nukes, as told to Fred Dungan*
- ◆ The H-Bomb and the birth of the Universe: 'For 100 Million years after time began, the universe was dark as pitch. The clouds of hydrogen condensed into huge nuclear fireballs. That moment-when the universe first lit up-was the moment of creation that matters...'
- ◆ American EMP Interaction manual: comprehensive theory of both the EMP source mechanism and the EMP pick-up in cables and antenna by electromagnetic induction (30 MB PDF file)
- ◆ British Mission to Japan, *The Effects of the Atomic Bombs at Hiroshima and Nagasaki*, H. M. Stationery Office, London, 1946 (high quality 42.5 MB pdf file).
- ◆ 1950 edition (high quality 82.7 MB PDF file) of U.S. Department of Defense book *The Effects of Atomic Weapons*
- ◆ 1957 edition (high quality 90.8 MB PDF file) of subsequently deleted sections on nuclear tests of civil defense countermeasures from U.S. Department of Defense book *The Effects of Nuclear Weapons*
- ◆ 1957 edition (low quality 30.6 MB PDF file) of entire U.S. Department of Defense book *The Effects of Nuclear Weapons*
- ◆ 1962/64 edition (high quality 188 MB PDF file) of major revised sections in the U.S. Department of Defense book *The Effects of Nuclear Weapons*
- ◆ 1962/64 edition (high quality 43.8 MB PDF file) of 74 pages of subsequently deleted material dealing with thermal ignition of houses at nuclear tests and civil defense countermeasures chapter, from the U.S. Department of Defense book *The Effects of Nuclear Weapons*
- ◆ 1977 edition (single 36.8 MB PDF file) of U.S. Department of Defense book *The Effects of Nuclear Weapons*
- ◆ Bill Forstchen, "One Second After" book about EMP attack risk and its effects on USA.
- ◆ U.S. Department of Energy Opennet Documents Online (includes many Nevada and Pacific nuclear test reports as PDF files)
- ◆ Defense Technical Information Center (DTIC)'s Scientific and Technical Information Network (STINET) Service (other declassified Nevada and Pacific test reports)
- ◆ Highlights from ABM testing history
- ◆ THAAD Goes Another ABM Test
- ◆ Alex Wellerstein's Restricted Data blog contains some interesting news (but beware of his uncritical use of unobstructed dry desert and nude skin thermal radiation and other effects predictions from the 1977 edition of Glasstone and Dolan; he deletes critically objective comments and pretends that honest criticisms of propaganda as being ignorant deception are rude as an excuse for ignoring the facts and refusing to engage in objective discussion of controversial aspects of this topic; basically if you pay homage and engage in groupthink bias you may be tolerated).
- ◆ Carey Sublette's Nuclear Weapon Archive (it contains errors from Chuck Hansen's compilation, and it is concentrated on bomb building, not on civil defence countermeasure evaluations done at nuclear tests; note that Chuck Hansen's books and CDs give a false quotation from Neil O' Hines's book *Proving Groundson* the effects of the 1952 Mike explosion on nearby Engebi Island, where Hines later in the book states that the native rats in fact *survived the intense close-in blast, heat and fallout under a few inches of soil, despite the initial ignorant belief that they could not have survived!!!*)

- Quantum Field Theory
- Los Alamos Science journal
- Excellent particle physics gauge theory (fundamental force interaction) issue of Los Alamos Science journal

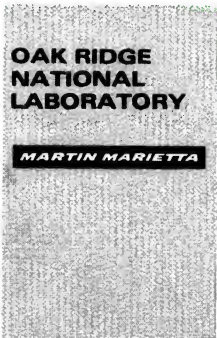


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Technical Options for  
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Toxic Vapors and Gases

C. V. Chester

The North Korean Missile Crisis (it's more of a ha...

New photos of non-collapsed Nevada houses after 5 ...

British Restricted manual, An Introduction to Nucl...

Anti nuclear terrorist Jeremy Corbyn

Everybody has the ability to detect and measure fa...

A problem with hate propaganda from CND's anti nuc...

Truth is the freedom to interpret all of the facts...



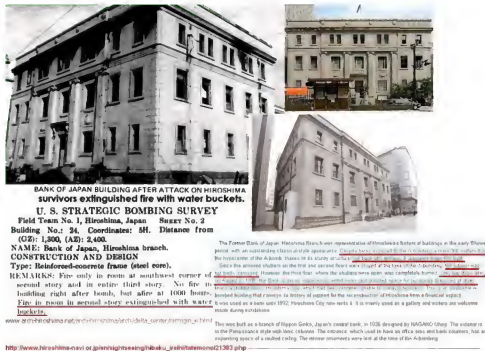
Trump's democratic success finally exposes for all...



Christmas 2016 Civil Defence Compendium: world pea...



God bless America! Brexit and Trump election compa...



The Bank of Japan, Hiroshima, survived 380 m from Ground Zero, within the first storm area, when fires were extinguished by water buckets by its survivors, the majority of people in the building having survived. Secret US Strategic Bombing Survey report proves civil defense for modern concrete buildings is effective. The building was reopened as a bank on 8 August, merely two days after nuclear attack, and continued in use as a bank until 1992. It remains in Hiroshima. This beautifully designed and sturdy reinforced concrete building was designed in 1936 by Nagano Ubciji. Cook's law: "Any man called Godwin who claims it is immoral to learn the lessons from the results of Nazi racist eugenics pseudoscience and to apply those lessons to those terrible media dominating celebrity-taboo-lovers who appease, cover-up, or defend the continuation of an evil, irrational pseudoscience which is causing unnecessary suffering today, is *defending injustice, inhumanity and irrational consensus evil and is not behaving as a humane, objective, person*. We need to ensure that the worst mistakes of the past are never repeated, if we are just, moral and caring towards our fellow human beings who do not deserve to be fed lies and dangerously complacent one-sided, biased propaganda based on a populist love of obsolete dogma, and/or a hatred of the search for objective fact, by pseudo-educationalists who prefer to live in utopia than in the real world of their fellow folk!"